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The New River.

AMONG all the institutions of "still increasing" London, there is not one which has caused greater interest than that "antient foundacon," the New River, which was inaugurated two centuries and a half ago, or, more correctly speaking, on the 29th of September, 1613. The old chronicler briefly sums up this great event in these words:—"On the Michaelmasse-day in Anno 1613, being the day when Sir Thomas Myddleton, brother to the said Hugh Myddleton, was elected Lord Maior of London for the yeere ensuing, in the afternoone of the same daye, Sir John Swinerton, knt., and Lord Maior of London, accompanied with the said Sir Thomas, Sir Henry Montague, knt., Recorder of London, and many of the worthy aldermen, rode to see the cisterne, and first issuing of the water thereinto. A troope of labourers to the number of sixty or more, well apparelled, and wearing green Monmouth caps, all alike, carryed spades, shovels, pickaxes, and such like instruments of laborious imployment, marching after drummes twice or thrice about the cisterne, presented themselves before the mount where the Lord Mair, aldermen, and worthy company beside stood to beholde them, and one man (in behalfe of all the rest) delivered a speech:—

> 'Long have we labor'd, long desir'd and pray'd
> For this great work's perfection; and by th'ayd
> Of Heaven, and good men's wishes, 'tis at length
> Happily conquer'd, by cost, art, and strength,
> And after fire yeeres deare expence in dayes,
> Travaile and payne, besyde the infinite wayes
> Of malice, envy, false suggestions,
> Able to daunt the spirits of mighty ones
> In wealth and courage. This, a work so rare,
> Onely by one man's industry, cost, and care,
> Is brought to blest effect, so much withstood;
> His only ayme the citie's generall good.'"

At which and further words the floodgates flew open, and the new stream flowed into the New Reservoir erected upon the site of "an open idle pool,"—a ducking pond,—and now more familiarly known as the New River Head at Clerkenwell.

Such, then, was the inauguration of the company's works, which, after a lapse of 262 years, still continues to supply the City and North London with water. Thanks to the preservation of the Records of the time of Charles I., we are now enabled to give a complete summary of the History of the New River, in a document which has recently been discovered among the State papers. It is not only interesting, but very valuable, being an official description of the undertaking, as given before the judges, and a curious review of one of the earliest troubles the company had to endure. While quoting the document in its original phraseology as far as we can, we shall refrain from giving those numerous repetitions with which, in all legal writings, we are so familiar:—

"Whereas, by vertue of two severall Acts of Parliament, the one made in the third yeare of the raigne of the late King James of ffamous memorie (the first), and the other in the 14th yeare of the saide late king's raigne of this realme of England, the Mayor, Comonaltie, and Citezens of London, and their successors, had free libertie given unto them, and were enabled to bring a ffresh streame of running water to the north parts of the said Citty of London from the springs of Chadwell and Amwell and other springs in the Countie of Hertford, not far distant from the said springs. And the said Maior, Comonaltie, and Citezens, considering the great charge and expense of the saide worke, and *doubtinge much losse might befall upon the chamber of the said cittie in case the saide worke should not succeede well and prove beneficall*, did thereupon forbeare at their comon charge to undertake the saide worke, soe as the same lay long neglected and unlike by them to be p'formed. And that Sir Hugh Middleton, Barronet, deceased, late Citezen and Gouldsmith of London, beinge willing of his owne private charge to undertake the said worke to that purpose, did make offer to the then Lord Maior, Aldermen, and Comons of the said Citty assembled at a Comon Councell holden within the said Citty on the XXVIIIth day of March, in the seaventh yeare of the raigne of the said King James, to undertake the said worke, and to performe (at his owne charges) whatsoever was or should be necessarie and convenient to be doone and performed on the parte and behalfe of the said Citiezens, which saide offer was willinglie accepted and imbraced by the then Lord Maior, Aldermen, and Comon Councell assembled. And that thereupon they, by their indenture under their Comon Seale bearinge date the XXVIIIth day of March, in the nineth yeare of the raigne of the said King James, made betweene the said Mayor, Aldermen, and Citezens, of the one part, and the said Sr Hugh Middleton of the other parte, did make and appoint the said Sr Hugh Middleton, his heirs and assignes, their true and lawful attorneys, deputies, and agents," to carry out the said work, confirming to him "the whole proffitt, comoditie, and advantage that should be raysed and gained by the said River New Cutt and Streame, and the water and benefitt of the water that might come or be conveyed thereby, and free libertie of laying and conveying the pipes for the currency and passage of water," through the districts authorised.

"And the said Sir Hugh Middleton did begin to convey the said springs in a new channel or river towarde the said Citty of London, and proceeded soe farre therein as that he brought the said water divers miles towards the saide Citty. But finding the charge of the saide worke to be greater, and the difficulties thereabouts to be more than he expected, the said Sr Hugh Middleton thought fitt to ioyne unto himselfe for helpe therein some other persons of qualitie which were willinge to adventure and ioyne with him in contribucon towarde the charge of the said worke, whereupon divers persons of qualitie became adventurers with the said Sr Hugh Middleton in the said worke, and made severall agreements to pay and contribute. And it was agreed that they should have and receive severallie to them and their heires ratable shares or parts of the proffitts to growe or arise out of the said worke, according to the proporcon of their severall disbursement. And after they had proceeded soe farre that it was founde to be feasible, the said late King James, considering that the said worke would be of greate use and benefitt unto the said Citty, and being willing to vouchsafe his ayd, by indenture under the Greate Seale of England, bearing date the second day of May, in the tenth yeare of his rayne over England, did agree to beare and paie the one-halfe and moietie of the charges disbursed and to be expended in perfecting the said worke:"

And the king in return to have half the profits, &c.

We now come to the very interesting details of the purchase of the site of the present New River Head:—"And the said Adventurers, for the better effecting and continuing of the said water-course and to make the same usefull for the said Citty, it was necessary to make and have a greate store Pond or Poole, whereunto the said new Cutt or Poole might emptie itselfe and thence be derived in pipes unto the said Citty in some convenient place neere the said Citty, and takeinge knowledge that Samuell Backhouse, Esquier, now deceased (who was one of the Adventurers in the work) was seised in his demeasne as of ffee of certaine land in or neare Islington, in the county of Middlesex, which was very fitt for that purpose, did thereupon treat with him touching the purchase of soe much of the saide lande as would serve to make such store ponde or poole and alsoe some other waste ponde to receive and hold the said water," with powers of ingress or egress, for the purpose of repairing or viewing the same when necessary, "and for layinge and repayringe of pipes whereby to convey the said water from the store ponde or poole unto the said Citty," the Adventurers paying "a greate some of money to the said Samuel Backhouse and Sir John Backhouse, or one of them," and contracted for the privileges to pay 6*l.* per annum to him or them "for the same waste pondes." "And after the said agreement made the Adventurers at their greate costs and expenses did digg and make one great and large store ponde or poole in the saide ground to receive and keepe the water running in and comeinge from the said New River, and walled the same roundabout with a faire brick wall, and at the entry thereof erected and built a fitt and convenient dwelling-house of brick" as a residence for the custodian of the same ponds. And they also made "two other waste pondes close adjoyninge to the said store ponde to receive and keepe the surplusage of the water of the said New River when the store pond was full," and laid main pipes from the grounds to the City, &c.

By letters patent dated the 21st day of June, in the seventeenth year of his reign, 1619, Myddelton and the other Adventurers were incorporated by the name of the Governor and Company of the New River, brought from Chadwell and Amwell to London, and the usual grants and privileges granted them. "After which letters patent at a Court holden by the said Governor and Companie at Sergeants' Inne in fleete-streete, London, on the second daie of November, Anno Dni 1619, all or the greatest part of the said Adventurers did seale and deliver certaine indentures unto the said Governor and Companie, whereby they did severally and respectively grant and assigne all their estate, and interest in the saide water worke to the said Governor and Companie for ever," and the company by another agreement granted to Sir Robert Naunton and others on

behalf of the king," the one moyetie or halfe of the cleere yeerly profitts of the said water workes." And at subsequent Courts the shares belonging to the Company's moiety were severally let, and orders made for the carrying on the business. The whole being entered in "a faire legier booke prepared for that purpose," and the accounts audited half-yearly, and other matters were contained in other books, "all which were suffered to be and trusted in the custodie of the Governour and Clarke of the said Companie for the tyme beinge; and that the said Sr Hugh Middleton being for divers yeares together after the said corporacon chosen and continuinge Governor of the said Companie until his death, and William Lewen from the tyme of the granting of the said patent of incorporacon until about Midsomer last (1636-7) continuall Clarke of the said Companie."

Subsequently, Sir Hugh Myddelton "obteyned the other moyetie in fee farme from his Majestie at and under the rent of 500 li. [500*l.*] per ann.," executing an indenture accordingly. Sir Hugh, by his will, dated November 20, 1631, and proved a month later, leaves all his parts or shares in the New River to his "loveinge wife Dame Elizabeth," and after her death a part or share each to his three sons and two daughters, and the sixth share to the Goldsmiths' Company, of which he was a member, in trust for their poor brethren. And he declared that the one half of the waterworks was divided into thirty-six parts or shares, thirteen of which belonged to himself, six of which he had thus disposed of, and the remainder passed into his general estate. After his death, his widow and William Lowen retained possession of the company's books and deeds, "whereby they are disabled to knowe the rents and revenues of the said New River," while Sir John Backhouse, although he had annually received the 6*l.* rent for the Islington land, "doth now make title [so says the Bill of Complaint made before the king in 1637] unto the said house and pondes pretending that the grounde whereon the said house is built and wherein the said pondes are made," were not granted to Sir Hugh Middleton or the adventurers, "and goeth aboute to take the same from the said complainants, their officers, or servants, whereby the said workes is like to be overthrowne and the said Citty deprived of the benefitt and use of the said water." The case being tried before the King in Council an order was made that if the widow of Middleton had two copies of a deed, one should be handed to the company, and if one then she deliver a true copy; that Lewin should hand them all the letters which Mr. Attorney-General Noy had written respecting the shares. "And as touchinge the said defendant Sir John Backhouse the Court then propounded that for an enlargement of recompense to him that his rent of six pounds per ann. should be increased to tenn poundes by the yeare." But to this arrangement Sir John would not agree, and coming again before the Court on the 18th of November, 1637, the King in Council made decree "that the said complainants and their successors shall from henceforth have, hold, and enjoy the quiett and peaceable possession of the land and premises in question, as well of that part thereof as is incompassed with a brick wall within which the store ponde or poole for the water worke is conteyned, together with the grounde or soyle on which the said brick wall is erected and the said house is built, together with the same house and yard thereunto adjoyninge, as alsoe of the other parcell of land and soile where the waste pondes belonging to the said waterworkes are made," paying to the said Sir John Backhouse and his heirs 10*l.* per annum, and permitting him, his heirs, and assigns "to have libertie for watering of the cattel going and depasturing in his, the said defendant's, grounds, next adjoyning to the premises, in the said wast pondes, and from tyme to tyme to put in and take out fish in the said wast pondes. And it was likewise ordered, according to Sir John Backhouse his desire, that the said complaynants shall not permitt any alehouse or taverne to be kept in the said cisterne house." And it was also ordered that the company should pay arrears of rent since the 20th of May last at the rate of 10*l.* per annum, and previous to that date 6*l.* per annum that Dame Elizabeth deliver one of two original copies, or a transcript of the original if she has only one deed; and that William Lewin deliver over to the company Attorney-General Noy's letters and the books belonging to them in his hands.

Such then is the substance of the interesting document just discovered, but to enable the reader to understand the importance of this decree it is only necessary to add that the New River Company hold the property mentioned therein to this day.

As regards the history of the undertaking, a few notes may not be out of place in order to explain the above narrative; but a most complete account may be found in Pinks & Wood's "History of Clerkenwell," published in 1865, pp. 441-471, or in Mr. Smiles's "Lives of the Engineers."

Hugh Myddelton was a native of Denbigh, whose castle had for governor during three reigns the father of our worthy. While working some Welsh mines he had acquired a good knowledge of levelling, embanking, &c.; hence, after he came to London, the proposal of the City to bring up the New River from Chadwell did not appear so visionary a scheme to him as it did to them. After undertaking the work, he soon found out that he had no easy task to construct this aqueduct some thirty-eight miles, not to mention the remarkable opposition he met with on the route by landowners and others. He had expended nearly 5,000*l.*, when want of funds compelled him to seek out King James, who had previously declared that, sooner than see the country abandoned to the will of the waters or lie waste and unprofitable, he would undertake the remedy. Accordingly, among the Exchequer documents we find the King advancing to Middleton, between the years 1612 and 1616, the sum of 9,430*l.* 4s. 2d., being one half the cost of the construction of the work. It occupied five years, although seven years had been allowed him, and the progression made for some time is evidenced by 600 men being employed. In return for the kingly help, James had half of the seventy-two shares in the undertaking, twenty-eight were possessed by others, and eight by Myddleton, but these eight were increased subsequently (by purchase from other adventurers) to thirteen, as we have shown by the extract from his will. The New River, which passed through King James's park at Theobalds, flowed into the Clerkenwell reservoir, described in the document above given, in 1613, and the company were incorporated six years later. The government was vested in twenty-nine adventurers, who held thirty-six shares, the King being precluded from personally taking any part in the management, although a representative was allowed him. No dividend was paid for twenty years, the cost of laying mains, &c., being very great; the first amounted to 15*l.* 3s. 3d. a share; the second, 3*l.* 4s. 2d., three years later; and in 1636, the year before the law case was decided, Charles I. was so "hard up" that he parted with his thirty-six shares to the company for the remarkably speculative sum of 500*l.* a year. Under the name of "King's Clogg" this payment is still annually made to the Royal Exchequer.

From this time the prospects of the New River Company became brighter, and before the end of the seventeenth century a good dividend was paid. In 1711, Lord Chancellor Cowper decreed that the possessors of two or more fractional parts of an adventurer's share,—for a share began to be divided when the property improved,—and equal to one whole might have a representative in the government of the company. The value of a king's share sixteen years later was stated to be 5,000 guineas; in 1766, worth 154*l.* per annum. In 1805 one sold for 4,400*l.*, and in 1813 an adventurer's share fetched 8,000*l.* In 1838 an original share sold for 18,000 guineas, and in 1852 three-sevenths of a quarter of a king's share realised 1,600*l.*, upon which a dividend was paid of 90*l.* per annum. In 1864 one-seventh part of thirty-sixth share (63*l.* 11s. 4d., half-year's dividend) sold for 2,490*l.*; one-fourth part (dividend, 117*l.* 13s. 2d. half-year), 4,670*l.*; and one-eighth and one thirty-second part (equal to five thirty-seconds), with a dividend of 68*l.* 9s. 8d. the half-year, 2,670*l.* At the great sale in 1870 of Miss Horton's property, comprising four-fifths of one king's share, five-twelfths of one adventurer's share, seventeen new 100*l.* shares, each fully paid up, and sixty-eight with 20*l.* paid up, the whole realising a dividend in 1869 of 2,105*l.* 6s. 11d., and a bonus of 1,726*l.* 13s. 4d., sold at auction for 62,429*l.*! Thus the seventeen realised about 195*l.* each; the sixty-eight from 50*l.* to 55*l.*; six twentieth parts of an undivided thirty-sixth share or king's moiety brought 11,720*l.*; eight sixteenth parts, 20,240*l.*; and seven twentieths, with two thirtieths of another, 17,650*l.* The dividend on the new 100*l.* fully paid up was 7*l.* 5s.; on the king's, 1,516*l.* 13s. 4d. or 75*l.* 16s. 8d. for each twentieth part, and conferring votes for Middlesex and Herts; 1,565*l.* 10s. 6d., or 97*l.* 16s. 10d. for one sixteenth part; 1,578*l.* 17s. 3d. for one adventurer's share, or 78*l.* 18s. 11d. or one twentieth of an undivided thirty-sixth (or adventurer's moiety). In 1872 two 100*l.* shares were sold for 200*l.* each; in 1873 one quarter of a king's share fetched 12,240*l.*, showing the whole share to be worth 48,860*l.*! Last year 274 London Bridge Waterworks annuities of 50s. each for 260 years from October 1, 1822, were sold for 16,020*l.* When the old waterworks were removed from under the arches of London Bridge, the New River Company undertook to supply the old customers, securing to the old waterworks proprietors their then dividend of 50s. per share as an annuity for 260 years, the unexpired term of the original lease for 500 years granted to one Peter Morrys by the Corporation of London in 1580. These shares have priority, as regards dividends, to all other New River shares for 207 years to come. At some trouble we have collected these curious details, feeling sure all our shareholder readers may derive some information worth having from them.

The New River, as originally formed, was 18 ft. wide and 5 ft. deep, with an average fall of 5 in. per mile. It is now 25 ft. wide, 38¾ miles long, and the water is allowed to subside in reservoirs at Cheshunt, Stoke Newington, and Clerkenwell,—a total area of 43½ acres. Twenty millions of gallons of water are pumped up to the reservoirs at Pentonville, Maiden-lane, Highgate, and Hampstead, by engines of 1,700 horse-power, and the total length of mains is about 620 miles. In 1869 the Parliamentary return exhibited the capital of the company as 2,609,418*l.*, and the daily average supply to 113,462 houses, having 800,000 inhabitants, is 23,790,667 gallons of water! And while the water-rents amounted to 150,943*l.* 14s. 8d. in 1855, they had increased to 250,010*l.* 4s. 9d. in 1869; ground-rents and rents on land, 10,952*l.* 3s. 5d.; and other items brought up the income to 285,529*l.* 2s. 1d. The expenditure, including for repairs, &c., 111,598*l.* 9s. 4d.; interest on loans, 39,721*l.* 4s. 11d.; dividends, 116,629*l.* 2s. 7d.; purchase of land, new pipes, and laying, 17,319*l.* 14s.; leaving a balance of 260*l.* 11s. 3d.

Aubrey, in 1682, complained that the growth of London only enabled the New River Company to supply water twice a week. This want of water caused them to borrow, in seasons of drought, the overplus water of the mill-stream of the River Lea near Ware, which was measured to them by a balance engine and gauge. The first supply not proving sufficient, Mr. Smiles tells us that their surveyor proved a valuable servant to his company by offering to pay double the price then paid for a pipe of double the diameter. The Lea River agent assented, not knowing that two orifices are to each other as the squares of their diameters, and the result was the New River received four times the original quantity of water at the cost of only double the original payment! In 1738 the Company purchased the Ware Mills, and other lands in Ware and Amwell, and by Act of Parliament 11 Geo. II., a perpetual rent-charge of 400*l.* per annum (now less land-tax of 40*l.* 8s.) was secured by them on this property. A family who had held it for a century sold it this present year for 8,640*l.*, thus further evidencing the value of property in connexion with this prosperous Company.

As for the founder, Myddelton, all he received was a Baronetcy in 1622, and dying Dec. 10, 1631, was buried in the churchyard of St. Matthew, Friday-street, London, in the registers of which parish are recorded members of the family between 1557 and 1730. It was left to later times to pay some little mark of respect to his energy and true citizenship, although two baronetcies in the family have been allowed to drop through the poverty of his descendants. The Corporation for a long series of years granted pensions to the family. But as long as the New River exists, so long will the name of Myddelton be honoured, not only by Londoners, but by all those who admire true enterprise, especially when carried out in the remote days, two centuries and a half ago.

The Institution of Civil Engineers.—We are asked to state that supplemental meetings for the reading and discussion of papers by Students of the Institution have been appointed for the following Friday evenings:—January the 21st and 28th; February the 4th, 11th, and 18th.

PRINCIPLES OF ORNAMENTAL ART.

BOOKS in illustration of the history and principles of ornament are numerous enough, and some of the existing publications of this class are so complete and admirable, so thoroughly established as standard works, that a book which manifestly does not aim at superseding or surpassing these must be expected to show some speciality to make good its claim to be added to the list. On looking at the preface of the volume before us,* we see at once that its author is aware of this, and we think he makes out a good *locus standi* for his book, while he assures the reader that he makes no pretence to do more than contribute a few scattered ideas for consideration. Taking as his motto Pope's couplet,—

"Content if hence th'unlearn'd their wants may view,
The learn'd reflect on what before they knew,"—

he selects certain points for special consideration,—"as, for instance, the influence of symbolism and religious belief on particular styles of ornamental art; the greater or less use of animal or vegetable forms, with its attendant question of the due amount of healthy naturalism or necessary conventionlism to be observed in their representation as elements of decorative design; the history and modification of various forms, such as the fret, the anthemion, the patera, the guilloche, which, though especially characteristic of classic art, crop up more or less recognisably at almost all periods." The influence of symmetry and subordination on the designer's work, and the ornamental use of caligraphy and the adornment of written character, are also subjects specially considered. Besides this, however, Mr. Hulme's book has the advantage of including a large number of illustrations of types of ornament (over 400) in a volume much more convenient and portable in form than well-illustrated works on decoration generally are. The element of colour is wanting, but the principles of ornament may in most cases be well illustrated in black and white; and the consideration of the subjects elucidated, and the style and calibre of Mr. Hulme's critical writing throughout, deserve the highest praise; in fact, we rarely meet with a work of this kind in which the subjects treated are so logically and fairly discussed, in a manner so entirely free from undue prejudice for or against any particular style or school.

To the subject of symbolism in ornament, Mr. Hulme devotes two long chapters, and treats the subject in an appreciative and, at the same time, a common-sense manner. The interest of symbolism, in connexion with the study of ornamental art historically, the absolute necessity of understanding it in order to appreciate the full meaning and sentiment of a large proportion of ornamental work of past ages, can hardly be over-rated; but the author avoids the error of supposing that therefore symbolism is a necessity of ornament generally, or of modern ornament at all. As he observes, "symbolic forms can never, in the future, attain to the importance they have done in the past, since, living as we do in a time when the opportunities both for imparting and acquiring knowledge are so great and widely spread, there does not exist the same necessity for this picture-language." The origin and meaning of most of the principal symbolic forms which have influenced decorative art are briefly described, without the disproportionate place being given to Mediæval symbolism which we are accustomed to find in recent works. Indeed, Mr. Hulme specially condemns the over-strained and extravagant use of symbolism in the Mediæval period, of which the following example, cited from Durandus, is curious enough to be worth recalling to our readers' memory. It is in reference to that unobtrusive piece of church furniture, the bell-rope. To the old monk sitting in the twilight of the abbey belfry,—

"The hanging rope by which the bell is pulled is humility, or the life of the preacher; the same rope also showeth us the measure of our own life. Besides this, since the rope hath its beginning from the wood upon which the bell hangeth, by which is to be understood the cross" [a point which, to his own satisfaction at least, he had proved in a preceding chapter], "it doth thus rightly typify Holy Scripture, which doth flow down from the word of the Holy Cross. As also the rope is composed of three strands, so doth the Holy Scripture consist of a trinity,—namely, of history, allegory, and morality. Again, the rope reacheth unto the hands by which it is grasped, because Scripture ought to proceed unto good works. Also the raising and lowering of the rope in ringing doth denote that Holy Scripture speaketh sometimes of high matters, sometimes of low; or that the preacher speaketh sometimes lofty things for the sake of some, and sometimes condescendeth for the sake of others. Again, the priest draweth the rope downwards when he, from contemplation, descendeth into active life; but is himself drawn upwards when under the teaching of Scripture he is raised in contemplation."

This is not a bad sample of a literary abuse of symbolism, similar to what was not infrequently made in the artistic use of it in the same period. A symbolic treatment should be direct, comprehensive, and to the point, not involved and far-fetched. Under these limitations, it may be of use in giving an additional interest or motive to ornament in modern work, though in a rather different spirit from that in which it was used in ancient work. It is worth remark that an ornamental feature may in a sense be symbolic, and even gain much in interest from the fact, though the symbolism is not precise enough to be connected necessarily with one definite idea. For instance, the ancient Egyptian symbol of the winged globe, though we may have lost the definite signification probably attached to it originally, cannot be regarded as a mere material decorative feature; it has a meaning and a suggestion to us, too vague, perhaps, to be expressed in words, but which quickens and stirs the fancy whenever the image meets us. Good examples of modern symbolic decoration of this half indefinite nature are to be found among M. Garnier's decorative detail in the interior of the Paris opera-house; and we have noticed some very fanciful and suggestive specimens used as head and tail pieces in some recent books: the pretty series of volumes, for instance, published under the title of "Moxon's Miniature Poets," contains some very poetical page-ornaments of this kind; little bits of design which are midway between pictorial and ornamental work, and just hint to the fancy something in harmony with the spirit of the poem on the same page, without being in any way "illustrations" in the ordinary sense. Dr. Dresser, in his work on Decoration, gives some valuable hints as to the path to be followed in thus lending an inner meaning to decoration. It is a line of decorative study which might, we think, be followed out a good deal further than it has been. Symbolism, however, it must always be borne in mind, has its right place only in decorative art; any attempt to combine it with the higher forms of art, in the shape of sculpture or painting, always tends to lead to a mannered and unprogressive art, in which the arbitrary signification confers a fictitious interest on the figure, irrespective of its artistic and expressive power. This is the main cause of that mannered immobility of Egyptian sculpture referred to by the author, in which one fixed and restricted type was rigidly adhered to, century after century. The interest of the work consisted in its religious significance as the symbolic representation of one or other divinity: hence the necessity for progress, for increased human interest and artistic power in the sculptor's productions, was entirely abrogated.

The use of inscriptions as an element in ornamental art, to which Mr. Hulme gives rather more than usual attention, acquires also a kind of symbolic interest, as distinguished from mere matter-of-fact information. The author exemplifies this rather well. "If, for example, we see 'Dent, London,' legibly inscribed on a clock-face, we realise at once that the matter-of-fact statement has no other object than to afford knowledge of certain business details; but if surrounding the dial we have a band inscribed 'Time tryeth, time flyeth,' we comprehend that the designer, desiring to beautify his work, has chosen an inscription full of thought and suggestiveness, as well calculated to attain the end in view." He quotes, as a very good actual example, the legend on a clock in the north tower of Exeter Cathedral (but we think it has been used in other instances also), surrounding the hour circle,—*Pereunt et imputantur*,—but Mr. Hulme's translation, "They perish and are reckoned," is inadequate; "are placed to our account," is the full signification; and the contrast between the brevity of the Latin and the round-about sentence necessary to render it adequately in English, is worth noticing in connexion with our subject, because it is this terseness and significance of Latin which justifies its use in modern inscriptions of the kind; a use which is sometimes complained of as an affectation of learning or of Mediævalism (according as the Latin is Ciceronic or "ecclesiastical"), but which is perfectly defensible, both on common-sense and æsthetic grounds, as the employment of a language better fitted for such expression than most others. In regard to inscriptions of this kind, there is also a reason in favour of the use of a dead or a foreign language which we do not see that Mr. Hulme has noticed; it brings the inscription out of the region of everyday-forms of thought, and throws a little "glamour" about it, more especially when, as in the case of Greek or Latin, the language used is one superior in construction and form to our everyday-speech, and of older and more venerable associations. In this respect Latin may be considered, as it practically has been to a great extent, as the language for modern decorative inscription, enjoying pre-eminence over Greek through its being more generally understood; but French also (a language of the Latin school) possesses qualities of terse and at the same time picturesque expression which render it often much fitter for ornamental inscriptions than English. German, on the other hand, is perhaps less fitted for this kind of use even than English. In the consideration of decorative writing we of course come upon the subject of illumination, recently become so fashionable a recreation. Some remarks of the author on the *rationale* of the subject are worth the attention of amateur illuminators:—

"The decorative effect will be very greatly dependent on the character employed; thus the Roman characters at present in use,—though, from their clearness and simplicity of form, of eminent work-day utility,—present but little scope to the designer; while the various Mediæval alphabets, from their picturesque character and quaintness, are especially adapted to art purposes. It follows, therefore, that where a decorative effect is desired, as in texts for church dressing, the Gothic character is, even to the present day, employed. This practice, though at times presenting some evident anomalies, does not seriously, we think, violate any law of artistic propriety, more especially as it is ordinarily in harmony with the architectural features of the buildings, so long as the text or other matter is clearly legible; though it at once fails of its primary object when, owing to overcrowding of accessory ornamental features, or the use of a character unknown to all but a few antiquaries, it appeals merely to the eye, and leaves the mind unsatisfied. There is great need, in the present day, when the practice of so-called illumination is so general with amateurs, who bring but little previous study to bear on their work, to emphasise the fact that the decoration,—the outer clothing,—is subordinate to the thought they thus seek to clothe. True illumination should aim at the clear and legible setting forth of some thought noble in itself. Any amount of good decorative work may be added in enhancement of honour to this; but as soon as the decoration, instead of being the accessory, becomes the principal feature, the whole aim is perverted,—the last becomes first and the first last, and the text or other passage that should at once strike the eye is lost in a labyrinth of forms that, possibly beautiful enough if kept in due subordination, become an eyesore and an impertinence when they usurp the attention, and thrust from its throne what should really be the centre on which the eye should without difficulty rest."

A good many architects, we may add, set a bad example of this kind of misuse of decorative effect in the manner in which they delight to disguise and torture into strange shapes the lettering on their drawings, not only when elaborate "letter-painting" is used, but even in the process of mere pen-writing, so that the extraction of the practical information which the writing is intended to convey becomes as great a difficulty as if it were purposely written, from diplomatic motives, in "cipher."

The use of inscriptions in such a way as to form actually a mode of surface ornament, as in the Assyrian sculptures, where sometimes a broad band is formed, crossing a figure or a group, by the incised writing carried right over the sculpture, belongs of course to quite a different class of decorative treatment by inscription from that which we have been considering. It belongs chiefly to Assyrian art, though we may regard the Egyptian hieroglyphics on columns, &c., as a kind of use of decorative writing on a similar principle. This method of employing writing is almost entirely unknown in modern ornamental design. It is possible, however, that it might be found a source of effect, where something in the way of a surface diaper was required. One way in which some modern designers do use writing in what is, we suppose, intended for a decorative manner, is to our thinking very silly; we mean the fashion, when such a thing as the name of a portrait or the subject of a head in a medallion is to be stated, of scattering the letters of the word irregularly about the vacant part of the space. This is neither one thing nor the other—neither writing nor ornament.

In regard to the subject of heraldry, we may call attention to Mr. Hulme's judicious and impartial way of considering it from a modern point of view; regarding it as a subject rather belonging to the past than the present and future of decorative art, but at the same time pointing out that if used at all, it is to be used with due reference to its own rules and traditions, apart from which, in fact, it loses most if not all of its meaning. "It is not a sufficient

* Principles of Ornamental Art. By F. Edward Hulme, F.L.S., F.S.A., author of "Plants, their Natural Growth and Ornamental Treatment," &c. London, Paris, and New York: Cassell, Petter, & Galpin.

reason for the violation of the special rules of the subject to deride it as obsolete, arbitrary, or absurd. It may be all this, and yet, if the thing be introduced at all, it should be rightly done, according to those rules. If the verdict on heraldry be an unfavourable one, it should at least spring from knowledge, not from want of knowledge." In this view we entirely concur; though thinking that, except with a few mediævalising enthusiasts, heraldry is likely to occupy a less and less place in what may be called illustrative decoration. It belonged to a state of society utterly distinct from the present, in regard to which its significance and utility have nearly disappeared.

Mr. Hulme's two last chapters on symmetry in ornament, and on the use and misuse of natural forms, are among the best parts of his book; and we have seldom seen more just and discriminating criticism on the opposite faults of over-naturalism and over-conventionalism than that contained in the first two pages of Chapter VII. What is said here is not new, but it is very well and pointedly said. In speaking of Egyptian art, the author holds it up as an example of an ornamental art founded entirely on forms indigenous to the country, and contrasts this with what he considers the unthinking copyism with which the acanthus is reproduced by "classic" architects,—"the modern English principle of manufacturing the ornamentation of capitals and string courses, *ad nauseam*, with a plant of Southern Europe, the acanthus, a plant unknown in England,—a plant that the Greeks introduced into their work, too rigidly to the exclusion of other beautiful forms, but with a delicate sense of its beauty; a plant that the Romans used in clumsy imitation, equally readily adopted, and that, therefore, from its classic associations, has obtained a firm foothold amongst us with all those who look not to the living spirit of Greek or other art, but to the mere letter; those who can copy being always a much larger body than those who can create." While we are thus repeating a single idea or form, once beautiful, now hackneyed, in architectural ornament, we find that in smaller and more personal adornments a continual demand seems to be made for something new and startling, without any consideration of its fitness or refinement. Mr. Hulme instances among these vulgarities of modern taste "one of the most selling things" of recent date, the horse-shoe, in a variety of forms. We can cap his examples with something worse than this: not many days ago we observed among the attractions set forth on the counter of one of the best-known jewellers in Bond-street a pair of (apparently) solid gold ear-rings in the shape of ladies' boots or *bottines*, about an inch in length along the sole, contrived to hang by the loop by which the real boot would be drawn on. We never remember really to have seen a lady wear anything so outrageously vulgar as this, but the fact of its presence in a shop of the first class shows that it is thought a "selling thing." Looking at such specimens of the taste of the day, as within the mark, no philippics that have been made on the subject would seem to us too extravagant.

It is *apropos* of this misuse of forms that the author draws an important distinction between *designing* and *decorating*; observing that to be a designer is to occupy a position higher than we associate with the word decorator; though, as he says, the two terms are often used as if synonymous. "'Decoration is the clothing with beautiful form or colour some object we desire thus to adorn, while design refers to the construction of any work both for use and beauty." We are not quite sure that the meaning of the word "design" can thus be limited, or rather, perhaps, the fact is that the word is in reality made to do double duty, and we really want a third word. But the principle inferred is quite correct, and it is worth while to emphasise it, because there is a notion rather too prevalent now with some people, that the architect's business is entirely decorating, and that the rest of it is all easy work; forgetting that there must be something worth decorating first, or, as Mr. Hulme in another place phrases it, that decoration "is an adjective and not a substantive."

The "Principles of Ornamental Art" is a companion volume to that on the use of plants in decoration, which we noticed at some length previously; and though it has not such a special value as that very excellent and suggestive treatise, the one is the complement of the other, and the two together would form an excellent general introduction to the study of ornamental art, before investigating separate branches of it more in detail. And while Mr. Hulme very ably puts before the student that which a book of a limited size can convey, he is equally careful to remind him how much there is which books cannot adequately convey, and to guard him against regarding the whole history of ornament as grouped and divided in the manner in which an author is obliged to group it for convenience of definition. With the observation on this point, under the heading "Styles," we will conclude our remarks:—"In using the term 'style' we must be careful not to fall into the error of considering the various epochs of ornamental art as so many distinct periods having no connexion with those which preceded or followed them; allowing nothing for the continuous change, the old giving place to the new, and the external influence brought about by contact with other men and other ideas. We may rather, perhaps, compare ornamental art, as a whole, to some great river ever advancing on its course, receiving on each side tributary streams, and incorporating them into its own volume of waters, influenced by various circumstances, here expanding into broad quiet pools, there confined by rocks and sand-banks, causing tortuous deviations. The view that many gather from mere book-reading, unaccompanied by personal study, is rather, if we may be allowed to continue our figure, that of a series of lakes, some large, others small and insignificant, some abounding in features of beauty, others having but little charm, dotted about in no perceptible order or plan, and having no connexion with one another."

WORKS OF THE LATE FREDERICK WALKER.

THE collection of the principal works of this gifted and early-lost artist, opened at Mr. Deschamp's Gallery, in Bond-street, more than bears out the estimate of his genius which thoughtful critics have some time since arrived at. His powers had, so far as he lived to develop them, certain limitations, rather in regard to idea and feeling than execution, which this exhibition no doubt exemplifies. There is a certain prevalent tone and bias in his conceptions, and a tendency to a special manner in the treatment and action of his figures, in his largest and most important works at least, which can less than ever escape notice when they are brought into close juxtaposition. It may be difficult to define in what this manner consists; its characteristics may be said to be a somewhat exaggerated action of the lower limbs of his figures, and a tendency to overstep probability a little in giving such curves and contours to the figures as might serve to intensify their expression and their part in the whole composition, without considering quite sufficiently their compatibility with natural action. We see this manner in the figure of the man mowing in the "Harbour of Refuge," in that of the woman in "Right of Way," and that of the boy in "Wayfarers," and in the figure in the finished study of "Mushroom Gatherers" (65 in the present collection). Yet this peculiarity was perhaps only characteristic of one phase of his artistic career,—the highest phase he lived to attain, but which might, had he been spared, have given place ultimately to a style in which his peculiar genius would have been further developed without this drawback of a mannerism of action. There is none of this in his earlier small works during his book-illustrating period. A good many of the sketches and drawings for these are hung, and serve to show, even more than the engravings from them which are familiar to us, how thoroughly spontaneous his genius was from its commencement.

The works which form Walker's principal claim to posthumous fame may be defined as idylls with a serious aim; works in which a deep sympathy with the nobler aspects of rustic life is combined with a perception of their intimate relation to and harmony with surrounding nature. In a previous notice, on the occasion of the artist's decease, we alluded to his picture at the 1870 Academy, "The Plough" (56 in the Bond-street collection), as the one in which his greatest qualities had been most thoroughly exemplified without the admixture of any defect of mannerism; and from this opinion we see no reason to dissent on again considering the picture in its connexion with his other works. It is a painting of the future of which (if only it has been *durably* painted as regards execution) there can be no doubt. It is one of those inspirations of genius which at once strike the eye and the mind as one connected whole—the feeling of the figures and the landscape completely in harmony, nothing out of place, nothing interfering with the expression of the leading idea; and in this case the tendency to an exaggerated action in the figure is not felt as a defect, but is natural to the situation, and, simple as the subject is, has really an element of the sublime in it. The "Harbour of Refuge," which hangs in the place of honour at Bond-street, is, we know, looked upon by many as the artist's greatest work; but when a calmer criticism is substituted for the excitement which the novelty and intensity of its feeling occasioned, it must be recognised that the picture has technical defects: the attitude of the mower is exceedingly strained, and the painter has somehow got into confusion in his aërial and angular perspective, between the foreground figures and the buildings and distant figures. The girl in the foreground could never enter the door seen at the end of the paved walk; if the perspective proportions between the nearest and furthest part of the wall be compared with that between the girl and the figure entering the door, this will be at once evident. This confusion seems to have become inextricable in the design; for, in the small repetition of part of it in water-colour (32) the proportion between the foreground figures and the group around the statue is again quite different from that of the large picture, the distant figures being in this case absurdly small; the point of view of the scene is slightly different, but not sufficiently to account for such a discrepancy. The work hung to balance "The Plough" is "The Old Gate," which is remarkable, among other fine points, for the noble character of the figure of the labouring man on the right, and the spirit and contrast in that of the lad accompanying him. There is much sweetness, too, in the figure of the lady issuing from the gate; the best lady, perhaps, painted by Walker, whose artistic sympathies with the humbler class seem to have been in general much closer and more genuine; while in his painting of characters of vagrant life he sometimes recalls the feeling of Wordsworth, to whom a "tramp" or a beggar was never without their common interest of humanity and brotherhood. This kind of feeling is certainly embodied in "Wayfarers" (of the two editions of which the water-colour one is, we think, the finest) and in "The Vagrants," in which again the powerful figure of the woman on the right, with arms crossed, and the smoke from the fire drifting past her, has a great deal of what goes to make the "sublime" in painting, in its own way.

We need not remind our readers of the talent displayed in the now well-known "Bathers" (64), but may just observe that, humble as the subject is, a great deal of what really constituted the excellence of Greek art is shown here in a modern form, viz., the direct study and reproduction of fine free natural action. The figures of the three lads who form the centre group, particularly the two who are just finishing their "unrobing," one kneeling and the other standing, are really noble figures in energy and freedom of action. Among the smaller works which illustrate different phases of the artist's power and conscientious execution, we may mention "The Fishmonger's Shop" (62), a piece of realistic finish and harmony, and brilliancy of colour, worthy of "the Dutch school"; the large study for "Mushroom Gatherers" (34), a dim, cold landscape of much poetic power; the scene from "Philip" (60); "The Ferry" (68) an exquisitely-painted village scene, and to be noted for the character and individuality of all the figures, and the grace and natural attitude of the girl in the stern of the boat; and the "Spring of Life" (71), a little out-door subject literally glittering with sunlight, the more noticeable as Walker's landscapes are in many cases a little deficient in true open-air effect, delicacy and refinement of tone being carried to the extent of rather losing force and reality of light and shadow. There are numbers of small domestic scenes, all full of character and point; we regret, however, to miss one of the most beautiful and refined of all the artist's works of this kind, the small interior, with two girls at a window, which was at one of the Water Colour Society's exhibitions, under the title of "The Rainbow"; this should certainly have been here.

There is no need to say that every one should go and see the collection before it is dispersed, for every one seems to be going.

THE NATIONAL SAFE DEPOSIT COMPANY'S PREMISES.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At an ordinary general meeting of this Institute, on Monday evening, the 17th inst., Mr. Henry Currey, Vice-president, in the chair, Mr. Banister Fletcher was elected a Fellow, and Mr. Baldwin Pyke an Associate.

Mr. Lewis Solomons, Associate, called attention to an important law case reported in the *Times* of the 15th inst., in which a decision materially affecting the relationship between architect and client was given. It was held by the judges that there was no evidence to prove the custom of an architect being at liberty to order "extras" without the knowledge or sanction of the client.

Mr. T. Chatfeild Clarke said the judgment went even further than that, and it was a matter of such serious importance to the profession that the case ought to be taken into consideration by the Professional Practice Committee of the Institute.

It was announced that the adjourned special general meeting of members only, for the consideration of the report on the affairs of the Institute, would be held on Monday next, the 24th inst., at seven p.m., instead of eight p.m. as previously announced.

Mr. J. Whichcord, F.S.A., then read a paper (of which the following is an abstract) "On the National Safe Deposit Company's Premises." Mr. Whichcord commenced by stating that the novel purpose of the building which he was about to describe, as well as the great interest of the ancient relics which had been disinterred in preparing for its foundations, would be a sufficient apology for his dealing with the subject of his paper. The problem which the Company undertook to solve was to provide a receptacle in the heart of the city of London, which should be proof against fire, burglary, and riot, and in which property small in compass, but of great value, might be safely deposited. In carrying out this instruction, he wished to acknowledge the advantage which he had derived from the advice of several eminent scientific men, who were consulted by the Company on technical matters. The establishment of public safes had originated in America in consequence of losses which had been incurred by fire and robbery, and safe deposits were now established in New York, Boston, Philadelphia, Chicago, and other commercial Transatlantic cities. After pointing out that ordinary bank cellars could not be regarded as proof against the chance of fire or skilled burglary, the lecturer proceeded to give a detailed description of an ingenious and almost scientific attack which was made last year on the National Bank at Pittson, Pennsylvania. In this case the thieves were alarmed, and made good their escape, but left behind them implements of their craft and all their paraphernalia, and abundant evidence of the extraordinary skill with which their attack had been planned. Mr. Whichcord also mentioned other instances of bank vaults having been penetrated in America, showing the skill and resources of the burglars. The Company in London, having regard to the extended sphere of operation which presented itself, determined to construct a very much larger establishment than any which existed in America. It was found necessary to design a perfectly undrillable armour plating in place of laminated iron plates, as well as to invent a simple contrivance for the numerous doors into which the *sanctum sanctorum* of the larger conception had necessarily to be divided. The first difficulty to be encountered was that of obtaining a suitable site, for while it was essential that it should be in the centre of the City, it was also a condition that it should be detached from other buildings on all sides, so as to prevent the possibility of access from adjoining property. The excavation for the vault in which the safe proper is constructed involved the necessity of going to the very unusual depth of 46 ft. below the street level, and owing to the nature of the soil, and the great lateral pressure of surrounding earth, this had to be executed with very great caution. During the excavations, a very interesting collection of Roman antiquities was discovered, not only curious in themselves, but, owing to the level at which they were found, illustrating the topography of ancient London. The date of the Roman remains was fixed by the coins found with them. They all belonged to the best period of Roman history, ranging from the time of Claudius to that of Antoninus Pius, no coin of later date having turned up, while between these periods the chronological sequence is unbroken. This abrupt cessation suggests that the site formed part of the first Roman settlement in London. Mr. Whichcord exhibited some of the more prominent relics, and said that their wonderful preservation was due to their being found immediately above the clay. He had also brought specimens of Roman piling existing below the remains. He suggested that most of the relics found at the extreme depth of the excavations were as early as the second century A.D. After describing some of the remains and relics thus discovered, Mr. Whichcord went on to describe the erection of the building which he was entrusted to design. The great depth at which the foundations had to be laid, and the treacherous nature of the soil, dictated the necessity of great caution in getting in the foundations, which was done by building the walls in trenches and at short lengths with strutting, of which a drawing was exhibited to the meeting. The external walls were built in very hard brickwork with cement, with a backing of hydraulic concrete of an average thickness of 6 ft. After the enclosing walls were thus laboriously raised to the level of the ground, the earth, within the enclosure, was taken out by means of steam hoists, and a cross wall was built to prevent the possibility of bulging from the great lateral pressure. Having thus secured a chamber, 80 ft. long, 46 ft. wide, and 45 ft. high, within which to construct the actual safe, the latter was made a distinct and isolated structure, with space which enabled the Company's officers to patrol it externally on all sides. The walls of the great safe are 3 ft. in thickness, built of extremely hard blue bricks, and an outer skin of fire-bricks. The brickwork, being intended mainly for protection against fire, was not considered sufficient defence from burglary or riot. A distinct lining of undrillable armour was therefore provided within the walls. A very important item of consideration was the doors, of which there are thirty-two, one to each of the compartments into which the structure is divided. On the principle that the strength of a fortress is only equal to that of its weakest part, it was essential that the doors should be as strong as the walls, and of a different kind from those used in ordinary bank-safes. They are made 12 in. thick, in solid metal, of various qualities, so as to resist either drilling or fracture. They weigh about four tons each, and are absolutely imperforate. They are opened, closed, and locked by hydraulic power, the precise application of which, for obvious reasons, was not described. The vault, as well as the several floors of offices below the ground level, are of necessity lighted and ventilated by artificial means, which Mr. Whichcord explained, together with the nature of the fireproof floors, and other practical details.

In the discussion which followed,

Mr. Puleston, the chairman of the National Safe Deposit Company, said that although he thought he was tolerably conversant with the construction of the unique building upon which Mr. Whichcord had expended so much talent, he had, by coming to hear the paper read, learnt a great deal more about the building, and what he had heard before was now rendered additionally clear to him. The architect's reputation, however great before he carried out the novel building under discussion, could not fail to be materially enhanced by his successful accomplishment of so unique a problem. He (Mr. Puleston) happened to be in America when these "safe deposit" structures were first devised, and he knew that all the conditions of commercial success present in America were present in this country.

Mr. Alfred White, F.S.A., read a brief supplemental paper, treating of the antiquities discovered during the progress of the excavations, and of the additional light which had been thrown upon the Roman occupation of London thereby. There had always been a tradition that the Walbrook was formerly navigable for boats and barges as far as Bucklersbury, although, taking into account the great difference between the level of high water and the present level of the street, it was difficult to realise that such was the case. However, the excavations for the Safe Deposit Company's building, which went to a depth of upwards of 40 ft. below the surface, had completely set the matter at rest. But how surprisingly great was the difference of level now and in Roman times! Perhaps the most interesting discovery made during the progress of the works was that of an *arca finalis*, or Roman boundary mark. These boundary-marks when found could rarely be mistaken for anything else, and might be looked for where two or three or more parishes or hundreds met. They were generally formed by excavating a small shaft, sometimes to the depth of 40 ft., the sides being generally bratticed or lined with wood, and the interior filled up with common pottery, metal, &c. Many of these *arcæ* had been found in various parts of the country, but no doubt many of them had been destroyed and all trace of them obliterated, frequently because they were not distinguishable from ordinary *débris* except to a practised eye. Had Wren been alive to the opportunity which was afforded him by having to lay out the city after the Great Fire of London, he would have searched for these boundary-marks, and probably might have been enabled to determine the plan of the whole of Roman London. The metal and other objects found were most interesting. The preservation of the metal was exceedingly good, and was no doubt due to the fact that it was found embedded in the clay, where, in fact, it would have remained for ever without injury. The ironwork was as sharp and as perfect as when it had left the smith's forge. Among the many objects of interest found, Mr. White particularised, among other tools, some mortise-chisels. In conclusion, he urged architects who had to carry out works on historic sites, to keep a sharp look-out for any antiquities that might turn up, especially Roman boundaries, which, although perhaps of no use now, might throw a great deal of light on the Roman occupation of Britain.

Mr. Lewis Solomons said that he had had occasion to give some attention to the subject, and he thought that, prior to the erection of the National Safe Deposit Company's building, the strongest safe of any kind was that which was erected for Mr. Streeter, the jeweller, when in business in Conduit-street. It was of iron in two layers, an outer and inner one, the intermediate space being filled with water. Even though a burglar might succeed in drilling a hole through the outer layer or coat, the water would escape, and in doing so would set ringing a number of electric bells placed all over the house.

Mr. J. E. Saunders, in moving a vote of thanks to Mr. Whichcord for his paper, said that until the advent of Mr. Whichcord's building, he (Mr. Saunders) thought he had built the strongest safe that could be built. Mr. Whichcord had, however, surpassed everybody in that particular line, and had, moreover, constructed a building which the Institute might be proud to acknowledge as the work of one of its members. Mr. Whichcord had given some very interesting details as to the testing of the girders; were any means taken to test the behaviour of the columns while bearing a load and at the same time subject to a great heat?

Mr. Edmeston seconded the motion, and asked what cement was used for the joints of the fire-clay casing round the iron columns? Again, he should like to know whether, when the girders were tested by fire in the manner described by Mr. Whichcord, the ends were open at each end or not. Had Mr. Whichcord any special reason for using iron in the columns,—for it appeared to including their surrounding coating of fireclay, him that the sectional area of the columns, would be sufficient or nearly so, to allow for the construction of the support entirely of terra-cotta. There were many other questions of detail which might be asked, although perhaps it would be unreasonable to seek to elicit too much information with regard to a building of this unique character.

Professor T. Hayter Lewis thought that the reading of such papers as Mr. Whichcord's, describing the construction of important and unique buildings, was of great practical service. The reason why such papers were not more frequently read was, that the architect of a building naturally felt some amount of diffidence in describing his own work. He hoped, however, that such a consideration as that would not weigh in the future, for who could so well describe the construction of a building as its architect? He, too, had been concerned in the construction of safes and strong-rooms for banks and companies, but, of course, had never produced a structure which could rival Mr. Whichcord's in invulnerability. He could not imagine how it would be possible either to break into or to burn down that structure. The building was certainly fireproof in construction; but not only so, there was nothing in it to burn, for it should be remembered that what would very often prove to be, under

similar conditions, practically fire-proof construction, was found to fail when made the depository for enormous quantities of combustible materials. Mr. Whichcord was deserving of great credit for the ingenuity he had displayed in a thousand and one little points, but he wished he could find a better term for the innermost part of his safe than "holy of holies."

The vote of thanks having been carried by acclamation, and Mr. Puleston having imparted some additional information as to the precautions taken to prevent the admission to the vault of any persons but those entitled,

Mr. Whichcord, in reply to Mr. Edmeston's first question, said that the joints between the blocks of fireclay casing to the columns were likewise of fireclay. As to the girder which was tested in the manner described, it was not a box-girder, but an ordinary T-shaped one, and the ends were made perfectly air-tight. It was not thought necessary to subject the columns to heat, because the horizontal girder behaved so satisfactorily under a crucial test, the like of which could not possibly be brought to bear upon the vertical column covered with its 4 in. of fireclay. The reason why fire-brick was not employed for the entire construction of the columns was that the weight to be borne was so enormous that nothing but iron could carry the weight within anything like a reasonable compass. As to the substitution of another name for the *sanctum sanctorum*, he had thought of calling it "the bottomless pit," but that name might be equally objectionable.

The meeting terminated with the announcement that the next ordinary general meeting will take place on Monday, the 31st of January, when a paper on "Old Cleeve Abbey" will be read by the Rev. Mackenzie E. C. Walcott.

THE KNIGHTSBRIDGE BARRACKS.

WE believe we may state positively that the War Office has determined on pulling down the unsightly nuisance at Knightsbridge, which has so long stopped the way, and prevented those improvements in the main road to London which are imperatively demanded, and would have been made long before this but for the pile of building in question. The department has been led to this, probably, by the fact that parts of the building are ready to fall and remove themselves if left untended much longer. Whatever the cause, this would seem to be, at first hearing, good news,—a satisfactory result of the loud public outcry which has been raised against the building for years,—if we had not the astounding further intelligence that it is proposed to rebuild the barracks precisely on the old lines. We can scarcely believe the statement, but the position of our informant forbids us to doubt it. A stir should at once be made on the subject. Such of the neighbouring residents as have heard of the threatened rebuilding are, of course, alarmed, and will, we suppose, take means to make themselves heard.

It has been proposed, in view of the statement that the barracks must be kept in the park, that they should be erected nearly opposite their present site, on the *north* side of the drive instead of the south, so that the high road might be improved, both as to width and having open park land next it, and the building take a better shape and aspect architecturally. This would certainly be better than the re-erection of the present most injurious obstruction, but we cannot admit the existence of a necessity for placing the barracks in the park at all, and trust that earnest endeavours will be made to obtain their removal to another and more fitting site.

New Gasworks for Birmingham.—At a special meeting of the Birmingham Town Council on the 11th inst., the Mayor read the report of the Gas Committee, and moved that they be authorised to enter into contracts for the erection of two new gas-holders and an extension of the retort-house and purifying apparatus, at the works at Saltley, at an estimated cost of 10,000*l*. In moving the resolution the Mayor said that the amount they now asked for was only a part of a larger sum that would be required in the course of the next few years. His Worship explained the various additions, alterations, and improvements which it was proposed to make, which would altogether necessitate an outlay of 28,000*l*., and for that they would get an extended supply of gas that would last for six years. The resolution was carried.

THE WESTMINSTER AQUARIUM.

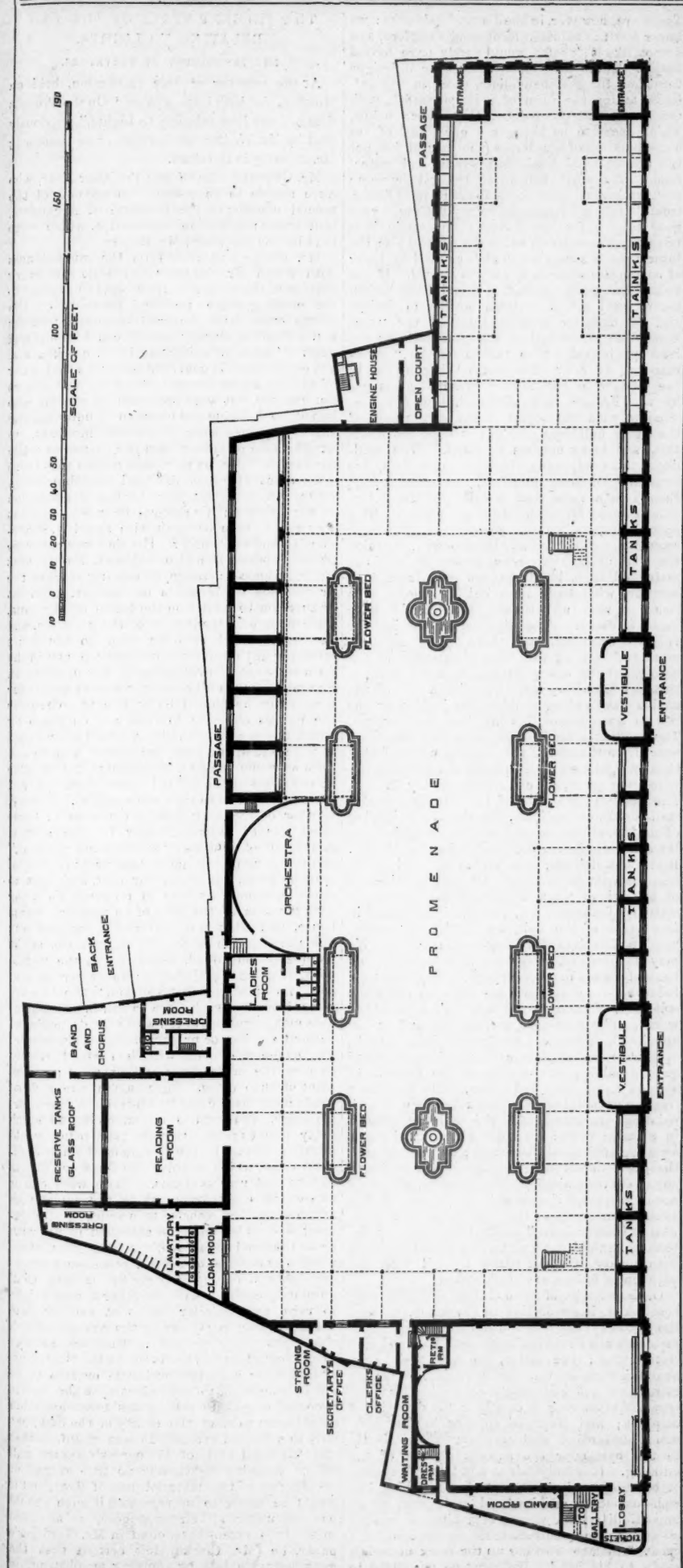
A FEW hours after these pages come into the hands of our readers, the ceremony will have taken place of formally opening to the public a building which, for the rapidity with which it has sprung up and been completed, deserves at least to be regarded as a phenomenon in modern building operations. Only eight or nine months since the north side of Tothill-street, Westminster, was an expanse of waste land of a most uninviting appearance. To-day it is the site of a place of public amusement on almost the largest scale in London and its neighbourhood, including a promenade and winter garden, an extensive range of aquarium tanks, a large orchestra, a collection of sculpture and paintings, billiard-rooms, dining and refreshment rooms, and a new organ and a new theatre "to follow,"—the former being still in the hands of the maker, the latter still in a "shell" condition.* With these exceptions, everything in the institution has been brought to a fair state of completion within the short period named. Certainly the modern contractor is, in his way, a great power.

We gave in our volume for last year† a view of the exterior of the new Aquarium, and in the present number we add a plan, which will show the general form and disposition of the building. As will be seen, there are only two street fronts, architecturally speaking; the *façade* of what is called the "front building," abutting on Princes-street, and nearly facing the west front of the Abbey, and the long elevation extending nearly the whole length of Tothill-street; the return along the narrow street at the west extremity of the site (Dartmouth-street) being little more than a blind wall. The remainder of the enclosing lines of the building accommodate themselves more or less to the boundaries of the surrounding property, and play no part in the architectural design. The public entrances are four, two in the east front to Princes-street (which perhaps might rather be regarded as one entrance with two porches), and two into the main block of building from the Tothill-street side. Entering from the Princes-street end, we find ourselves first in the front building, a parallelogram of about 120 ft. by 80 ft., with a semicircular iron and glass roof, and a gallery supported by a single range of iron columns running round it. Around the walls of this portion of the ground floor are ranged the smaller tanks, with other isolated tanks and a fountain in the centre of the room, and in front of the wall tanks, along the line of the gallery columns, are formed beds of earth planted with large exotic shrubs, while the lower parts of the pillars, with wire trellis arranged round them, are intended to form centres for climbing plants. At the west end the apartment opens out into the main building. It was at first intended to divide the two portions of the building by a solid wall, with only a 6 ft. doorway in the centre leading from one to the other; but this has been reconsidered, and, on second thoughts, wisely abandoned. The whole space is now thrown open, the upper portion of the wall of the main building being carried by a large wrought-iron girder spanning the whole width of the opening. Thus a view of the entire length of the building can be obtained, and a much greater effect of space is secured than if the one portion had been shut out from the other: at the same time we may say that an open colonnade or arcade would have had a better effect than the mere opening, with the uninteresting box-girder over it. However, through this opening we walk into the main building, which is a parallelogram of 340 ft. by 130 ft., the width being taken between the fronts of the tanks, which for the most part form the actual boundary of the floor area. Here the gallery, which runs right round, is more than twice the width of that in the front building, and is carried on a double range of iron columns. The whole of the central portion, between the side galleries, is roofed by one great "barrel vault" of iron and glass from end to end, the ends also forming large semicircular windows, so that there is no deficiency of light in this part, at least, of the interior. The length is divided into five principal bays, each of the width of two interspaces of the iron columns, by the projection at equal distances of two additional columns advanced beyond the main line of the gallery front, and which assist in carrying the main girders of the roof, which are grouped in pairs and connected by transverse ties. Thus we have four main arches or "principals," each the width of one intercolumination, separated by bays of double that width. From an architect's point of view this is the best feature of the building, as a union of effect with constructive arrangement; and it is rather curious to trace in this construction the form and principle of the old Romanesque barrel-vault of masonry, with its main transverse arches over the piers and thinner vaulting surface between, thus translated into the glass and iron language of modern aquarium architecture. The beds for shrubs, &c., we may observe, are formed at the feet of the projecting columns, so as further to emphasise their main divisions. Looking from the east end, where we enter from the front building, the wall to our right in the first two bays is occupied by the largest tanks, seven in number, each about 18 ft. square; the third bay on the same side is occupied by the orchestra; and the area of the "pier" beyond is occupied by ladies' retiring-rooms. In the last two bays on the right the floor area is clear back to the main wall, and through this a door leads to the reading-room, a large apartment, about 48 ft. by 45 ft., and further on in the north-west angle are the gentlemen's lavatories. To the east of the reading-room is space for the band and chorus, and dressing-rooms for principals, connected by a passage with the orchestra, and reached also from the main area by a door which is too near that of the general ladies' room, which latter does not appear to us, in fact, to be very well placed. The west end, opposite to our supposed standpoint, is closed by the blank wall dividing off the theatre, which is a separate building with a separate street entrance. The south wall, on our left, is occupied in the second and fourth bays with the entrances and vestibule from Tothill-street, and the whole of the intermediate portion is lined with tanks of the same width, and having the same outer finish as the large tanks opposite, but only 7 ft. in depth from back to front. Of the galleries, we need only observe that they are continued right round the building, except at the one point on the north side, where they are stopped by the upper portion of the orchestra. The western half of the galleries is occupied as picture galleries, which are already filled; in the centre of the south gallery, opposite the orchestra, is formed a kind of "grand stand," or inclined platform, for "reserved seats" for hearing the music; and the wide area at the east end is to form the principal dinner or refreshment room. This we think a mistake in point of effect. Dining "in the open" is neither comfortable to the feeders nor to the lookers on; a room divided off is much better. The roof over the galleries is ceiled with plaster (Parr's "Martin's cement"), in what we heard called a "coffer" form, but which we should rather describe as a "hopper" form. The light, which is admitted through the side-glass in a raised skylight, with an opaque soffit at the top of each hopper, is lamentably insufficient for the pictures, and some alteration will have to be made here. The additional space in the roofs behind the raised pediments towards Tothill-street is utilised for billiard-rooms, reached by stairs from the south gallery. This is the only second floor in the building, or at least the only one with which the public have anything to do. Of the theatre we say nothing at present, as it is only as yet in a very early stage in regard to interior construction and fitting up.

So much for what is seen, or to be seen, of the building; but what is not seen is equally important. The visitor who parades the wide boarded floor of the main building is, unawares to himself, walking over "a waste of waters." The whole of this portion, beneath the floor level, is divided off into nine large brick tanks, separated by thick walls, and with invert and culvert arches. These are all laid, in the first instance, on a thick bed of concrete, extending over the whole centre area of the site, and when in addition to this it is remembered that each of the main walls stands on concrete footing 9 ft. in width, some idea may be formed of the amount of value in labour and material which has disappeared beneath the ground level, before the architectural portion of the structure arose to view. Of these nine tanks two contain fresh water, all the rest sea-water, and these latter are connected so that the water admitted at the west-end of the building has a continuous flow through all the tanks, is pumped up and used in the glass tanks, and then re-collected

* In the original plan this apartment is designed as a concert-room, but is now to be fitted up as a theatre: a far better use to make of the space, as musical performances are already provided for in the main building, and a good theatre in the neighbourhood of Westminster is much wanted.

† Vol. xxxiii., pp. 392, 393.



ROYAL AQUARIUM AND WINTER GARDEN, WESTMINSTER.—*Ground Plan.*

and taken round to a head, whence it circulates again through the tank system. The engine-room is in the north-east angle of the walls of the main building and front building, and near this point are two wells, into which the sea-water and fresh-water respectively flow, and from which they are pumped by four pumps to each well. One engine does the work; but two, as usual in such cases, are provided to prevent any catastrophe in the event of a breakdown; as a stoppage of two or three hours in the flow and aëration of the sea-water in the tanks would be fatal to a large proportion of their occupants. Arrangement is made for disconnecting and emptying any tank for repairs, without interrupting the flow of the water, which is continued through a pipe from one wall of the tank to the other.* These pipes, and all pipes through which the water is conveyed to the aquarium tanks, are of vulcanite; a point insisted on by Mr. Lloyd, the naturalist to the Aquarium Company, as iron acts injuriously on the health of the animals which are to live in the water supplied through it. At the instance of the same able adviser the lining of both the supply-tanks and the living-tanks is done with asphalte; cement having a deleterious chemical effect on the water. The laying of the asphalte was attended with some difficulty, as when placed, at a heat of 300°, on the bricks, it generated steam where the bricks were more than ordinarily wet, raising the surface of the asphalte, which had to be perforated for its escape and then made good again. From this, as well as other causes, a good deal of trouble has arisen from temporary leakage in the supply tanks, the position of the leak being often difficult to find, and the only test of the tightness of the tank being to fill it with water and observe any alteration in the level. However, this has all, we believe, been successfully got over. The large living-tanks are built so as to provide a due foundation for the considerable weight of water which they will have to carry; the pressure on the walls being distributed on the foundation by inverted arches below, discharging the weight on to a bed of concrete, and filled up with concrete to the level of the tank floor.

The building is warmed by hot-water pipes, which obtain their heat by the water passing through chambers filled with the waste steam from the engines, and are continued in a flow and return along a continuous chamber, covered with an iron grid on the floor level. The gas-pipes are laid in the same channel, so that all these pipes are together, and within easy reach; and into this channel also the necessary drainage from the flower or shrub beds is carried. The kitchen is over the engine department, with a hoist down to the level of the gallery floor, where, as we observed, dinners will be served.

The roof, which, as far as its construction is concerned, has been carried out by the Thames Ironwork Company, appears an admirable piece of work, and we are assured, by those who ought to know, that the accuracy of the casting and fitting could not be surpassed. Indeed, the generally excellent workmanship throughout the building is remarkable, considering the rate at which it has been got up. The glazing is on a principle which has never yet been applied on so large a scale, and the result of which, in this instance, we shall be interested to observe. The principle is that patented by Mr. W. E. Rendle, to which we devoted a commendatory note in the *Builder* of January 30th, last year. Its speciality, as our readers may remember, consists in dispensing with putty, and all other extraneous compositions for ensuring watertight joints, and simply inserting the glass in grooves formed by zinc fixed on wooden cross battens secured to the iron ribs, into which grooves the water runs at the foot of each pane of glass, and from a cut in the centre of the zinc drains on to the centre of the pane next below; the panes are laid side by side with a vertical lap of about ¾ in., over and under alternately, and it is asserted that any water which may be blown through the joining would simply run down the inner surface of the glass, where again it will find a drain groove to carry it harmlessly away. The behaviour of so large an area of roof as this in a strong wind, accompanied by rain, will be about the most severe test it could be put to. We hope it will prove entirely successful, for every constructive invention which tends to do away with artificial and perishable cementing of

* We presume the division of the water into various tanks is mainly with the object of facilitating repairs of this kind, and of dealing more safely, and in the end more economically, with so large a body of water.

any kind, and make the construction depend for its success on the method of putting the materials together, is a step in the right direction, both architecturally, and, in the long run, economically.

The floor of the main building is, as we observed, of wood on joists laid on the top of the tank brickwork; the floor of the front building is, however, of Minton's tiles, in a simple but, on a large scale, effective arrangement; and the east porches are laid with random mosaic (Burke's) in the same manner which has been used in the corridors of the Manchester Town-hall, where we last drew attention to it. Some mosaic of more artistic pretension, containing figures of fish and marine plants (a sort of section of the sea, in fact), which we saw being arranged on the floor of the main room, we presumed was intended for a similar position in the Tothill-street entrances.

The orchestra appears to be well constructed for sound; it is enclosed in a large alcove or apse the full height of the gallery roofs, entirely of timber construction, and finished with canvas-covered boarding. The organ, which has been superintended by Dr. Stainer, is being built by Mr. Jones, of Fulham. It cannot, from the space, be a very large one, though there will be more of it than appears externally, the large pedal pipes being relegated to the back of the orchestra. As the main floor is continued under the orchestra, which is merely, in fact, a fixture built upon it, the sound of these pipes will travel well enough.

Ventilation does not form part of the regular scheme of the building. There are louvres in the roof for carrying off foul air; for the admission of fresh air the general opening of the entrances, &c., is trusted to. In a building where there will be such constant ingress and egress this may very probably be sufficient; there is no doubt it will create considerable draughts in cold weather. The regular admission of air through the hot-water chamber would have been more to the purpose. In the reading-room, where we are told also that no special provision for the introduction of fresh air is made, the deficiency will unquestionably be felt, and felt seriously, when the room is full, more especially as it is rather low for its size; and alterations must be made if the room is to be healthy for occupation. It is astonishing how often it is necessary to repeat the truism, that regulated supply as well as escape is a necessary condition of proper ventilation.

Before concluding with a few general remarks on the new edifice, we may just mention that the whole arrangement of the living-tanks and everything connected with the naturalist department has been done under the direction of Mr. Lloyd; that the florist is Mr. Wills, fellow of the Royal Horticultural Society; the carving has been done by Mr. Bromfield; the glazing of the east window and the decorative painting on the walls of the east galleries by M. Durand, of Paris, for whom Mr. Weigner is the English agent; the ornamental tiling is Minton & Co.'s; the engineers are Messrs. Leete, Norman, & Edwards; and the heating apparatus is supplied by Mr. Phipson; the gasfitting by Messrs. Forrest & Sons; and the lavatory fittings by Mr. Jennings. The general contractors were Messrs. Lucas, whose contract for the main building was nearly 90,000*l.*; but, of course, there have been many additional smaller contracts for special branches. Their foreman at the building throughout has been Mr. Robertson. The work has been done under the superintendence and from the designs of Mr. Bedborough, architect, and under the immediate supervision of Mr. Greenman as clerk of works.

As to the general aspect and finish of the interior, it may be at once conceded that it would be unreasonable to look for anything very noteworthy in the way of artistic detail or effect in a building got up against time to secure a speedy return for the outlay. Many things might have been worse, some might certainly have been better. The general effect of colour in the iron work, a warm bluish tint lined out with strong red, and with gilding in the capitals, does well enough. The fronts of the principal tanks, finished in black enamelled slate with polished granite sills, and marine tile-pictures in the spandrels and pilasters, are very satisfactory in effect. The small tanks in the front building are of the same black slate, with a bordering of white tiles with a green leaf pattern along the lower edge; and the principal centre tanks, in the middle of the apartment, formed of the same material, are relieved by pillars and angle shafts of red marble. These are, however, in the form of balusters: we never saw the baluster form used so before, and do not like it; shafts would surely have looked better. There have been some special designs furnished for gas chandeliers, those in the galleries taking the form of a large starfish, with the burners at the points; those down below, which seem to be thought a good deal of, are a combination of sea-horses (the natural fish, not the conventional sea-horse), swans, and water-reeds. The small fish which has got the name of "sea-horse" from the shape of its head forms, from its characteristic and spiney outline, a very good subject for metal work; but while it is introduced here about twice the natural size, the intermediate swans are models about 4 in. long: of course the contrast of scale is absurd. If the swans had been omitted, it would have been a rather good bit of suitable novelty in design. Did the designer possibly think of the "sea-horse" as an animal of the same scale as the land quadruped,—as a mount for the "horse-marines," in fact? The worst thing by far in the interior is the tawdry coloured glass put by the French firm aforesaid, into the east window, with the object of hiding the roofs of the other buildings outside; it does not effect this, and looks hideous in itself. The wall-decorations adjoining, by the same firm, are much more delicate in effect, and rather pretty, though in a taste that few English decorative artists would approve. They are produced by a special process, said to combine rapidity with economy. The manner, by the way, in which the ends of the two semicircular roofs of the main and front buildings are seen from each interior, with their lines cutting across each other, is very unfortunate, and should have been foreseen. The lighting of the interior is well arranged, and there is an arrangement for lighting the rows of burners at the cornice above the galleries; a small lamp is slung up in chains, and then with a pull of the chains travels along a sliding bar just below the row of gas-burners, lighting them as it moves. The reading-room is being specially decorated, apart from the rest of the building, by the Tinfoil Company, whose process quickly and economically realises an effect, but can hardly be very durable. The general furnishing of the interior includes stall-stands, or *boutiques*, for the sale or display of goods, and also numerous refreshment buffets, the contracts for all which are taken by Messrs. Bertram & Roberts, who furnish the whole of the commissariat department. Of the general effect of the whole when filled, and the objects of statuary, fountains, &c., completely arranged in the centre of the hall, we cannot, of course, speak at the time of writing these remarks. We may just observe, however, that those who, from the statements in the newspapers, may have been led to believe that there was anything like a fine collection of pictures, in the artist's sense of the words, to be seen here, will find themselves disappointed. There is a very good shilling's worth of square feet of pictures for the interest of the general public; but, in spite of the presence of a good name here and there, little to attract from an art point of view, at least as far as the oil paintings are concerned. The sculpture seemed to promise more: we noticed some good works awaiting their final placement; and, considering the great disadvantage sculptors are under in any of the recognised exhibition-rooms, we should not be surprised if some able artists were glad to avail themselves, as they did in the recent annual "International" exhibitions, of the opportunity of exhibiting sculpture in a good light and with plenty of space round it, and with the adjuncts of foliage as a background.

Of the exterior of the building, architecturally considered, if we decline to say much, it is on the ground that much cannot be said. The materials are Fareham brick, and Portland and Bath stone; the latter, to use the happy generalisation of the *Times* reporter, "freely introduced and elaborately carved." This elaboration of carving is chiefly in the direction of dolphins; and Neptune appears in the pediment, and other emblems convey sufficiently to the bystander the aquatic objects of the building. It is only fair to add that the system of building against time renders anything like well-considered architectural style next to an impossibility, and when everything is wanted all at once an architect must be reduced to a great extent to working up the stock materials ready to his hand. We must be permitted to hope, however, that the style of the New Aquarium will not be taken as a *point de départ* for other new buildings in the neighbourhood.

THE PRESENT STATE OF THE LAW RELATING TO LIGHTS.

THE INSTITUTION OF SURVEYORS.

At the meeting of this Institution, held on Monday, the 10th inst., a paper "On the Present State of the Law relating to Lights," previously read by Mr. W. Dundas Gardiner, was discussed; Mr. Squarey in the chair.

Mr. Chatfeild Clarke and Professor Kerr, who were unable to be present, on account of the special meeting of the Institute of Architects, sent their remarks in manuscript, which were read by the secretary, Mr. Rogers.

Mr. Clarke commented on the completeness with which Mr. Gardiner had dealt with every portion of the subject. He wished to present to the meeting some practical thoughts on the means by which the constantly-recurring troubles and difficulties about "lights" could be met and dealt with at once inexpensively, quickly, and yet equitably. It could not be denied that many of the cases now brought before the courts were not genuine, but were promoted by persons who hoped, by delaying the course of a building, and thereby jeopardising important interests, to extort a sum of money from the parties to settle the matter. He by no means denied that there were cases of great practical hardship which arose, and the great point for the consideration of surveyors as a practical body was in what way could these be dealt with speedily, economically, and efficiently? His view was that two or three courses should be followed. Firstly, that the court should arrange, at an early stage of the proceedings, to appoint a professional architect or surveyor to advise on the whole of the facts, after a careful inspection of the premises, and that this should be done prior to the court receiving any opinions of professional men in the form of "expert" evidence or by way of affidavit. Secondly, that in all cases where such an adviser is called in, he should be at liberty to require the parties claiming to raise any buildings by which it was alleged the light would be excluded to put up temporary screens in such a mode and form as would enable a professional man to judge of the effect of the alleged obstruction, this trial to be made on more than one occasion. Thirdly, another of the most difficult elements in these cases was to determine how far the alleged diminution of light was "sensible and material," and it was upon this point that great conflict of opinion arose. It was clear that the light to select diamonds by was in no sense on a par with the case of the light of an ordinary warehouse, and what was material in one case was immaterial in the other. Such instances might be greatly multiplied, especially in the metropolis, where such multifarious trades were carried on. His view was that the courts should have power in each of such cases to call in an independent man, cognisant of the special trade, to advise, without any bias or presumed bias on either side. The evidence of such witnesses would greatly shorten the proceedings and expedite a settlement of such cases. Then, again, the mode of conducting these cases by affidavits and counter-affidavits, and replies on such, led to much delay and expense, though this point would probably be met by the powers of the new Judicature Act, which enabled the Chancery Courts to take *viva voce* evidence. There were one or two grounds of settlement in these instances which were often resorted to in amicable arrangement, and which might be extended in use with great practical advantage, one being that where a building is raised opposite another, each retaining rights of light, the party first raising shall absolutely contract with the other to give a right to raise to a similar height at another time hereafter, each party having the power to attach this right to the property. There was another plan, adopted, he had been told, on the Continent, of requiring a certain well-hole or area to be left in proportion to the height to which it was proposed to go. In many cases this suggestion would seem to meet the equity of the case, but only to a limited extent. It was manifest that the oft-quoted angle of 45 degrees from the wall of the opposing lights was no true ground of deciding as to the material loss of light, and it would be much to be regretted if such should become, under all circumstances, an accepted rule. In a recent case, cited in Mr. Gardiner's paper, he (Mr. Clarke) felt certain that the most accurate test by applying an obstruction above the 45 degress line to a moderate height would have made no sensible or material diminution of light to the dominant tenement. The

subject was full of interest, and of points for discussion and elucidation.

Professor Kerr said he had read Mr. Gardiner's paper with extreme interest, and he thought that gentleman was entitled to gratitude for the clearness and conclusiveness of his explanations. But he wished he could more readily confirm Mr. Gardiner's opinion that the result of the development of the law of ancient lights during the last few years had been to reduce it "to principles easy of comprehension and enunciation." His (the speaker's) experience as what was called a "scientific witness" led him, he regretted to say, to an opposite conclusion. The uncertainty of the law with regard to disputes connected with building operations generally was notorious; but he was obliged to confess that in cases concerning ancient lights, the bewilderment of all alike who were engaged in the controversy seemed to be more astonishing than in any other kind of business he knew. It was no doubt true that by means of the series of judicial decisions which Mr. Gardiner had so lucidly set forth, with others touching collateral points, the Chancery Courts had, to all appearance, determined the general bearings of the law, and left scarcely anything open for controversy in the form of leading principles. But when Mr. Gardiner added to the proposition that such principles were now "easy of comprehension and enunciation" the suggestion that they might nevertheless be "difficult of application to the varying circumstance of the different cases," it seemed to the speaker to account for all the confusion of law which the surveyor saw where the lawyer saw none. In other words, the lawyer had to do with abstractions, which might be more or less readily reduced to a system of principles sufficiently "easy of comprehension and enunciation"; but the surveyor or architect had to take up a multifarious variety of circumstances, and here he found the "difficulty of application" of those principles to be such that the very principles themselves too frequently vanished into mere suppositions. To take, as an example, the question of adding to the area of ancient lights, as set forth by Mr. Gardiner in his paper. The lawyer supposed a typical case, and one that should narrow the issue to the utmost. His (the speaker's) neighbour had an old window in a wall which stood against his open land. Through his neglect that window had remained unobstructed for twenty years. It might have been obstructed by him at any time by the usual and simple means of setting up a board so as to cover it. If he had not so obstructed it, the fault was his own, for he was supposed to know how to protect the interests of his property. When he continued to neglect the protection of such interests, the time must come when it would be unfair to assert his old unprotected rights against the conditions which he had allowed his neighbour to rely upon so long. Accordingly, having thus permitted his neighbour to use the window for twenty years, the law said,—and perhaps reasonably enough,—that the time had come when his neglect should be conclusive against himself; therefore he was now prohibited for ever from putting up a board against his neighbour's window. But his neighbour increased the size of the window; thereupon he put up a board against the increase, scrupulously leaving uncovered the exact area of the ancient light, but definitely obstructing all the rest. Nothing could be simpler, and out of this simplicity of imaginary circumstances the logic of legal argument arrived readily enough at a theoretical principle. Thus far the surveyor, as the practical man, concurred absolutely; but how long did such concurrence last? Not for a moment when the theoretical principle had to be practically applied, for the lawyer assumed that, because the case narrowed the issue to the utmost, the principle was, therefore, comprehensive to the utmost. That window should represent all windows; that enlargement all enlargements; that obstruction all obstructions; but the surveyor was constrained to declare that, as matter of fact, so multifarious were the peculiarities of building operations, that the narrow issue supposed never really occurred at all. All other kinds of windows, all other kinds of enlargement, and all other kinds of obstruction except those named in the suppositious case, were what had to be dealt with in actual practice. Let any surveyor who had had much experience in cases of actual litigation about ancient lights call to mind how many other abstract questions there were, and much more complicated, even, than the one mentioned; how many ingenious contrivances there were for the assertion of convenient rights, how many desperate schemes for the evasion of inconvenient wrongs; and he would agree with the speaker in asking the learned lecturer to pause before he attributed too much importance, as regarded the public enlightenment, to the mere assertion, by a succession of able logicians, of a succession of abstract principles, the difficulty of applying which in unforeseen circumstances rendered each new case in reality a new question. This was all he would venture to say about the law; as a practical man, he found it in utter confusion. But the chief concern of surveyors was not with the application of dogmas of law, but with the preliminary appreciation of materiality of damage. If there was no material injury occasioned by any given obstruction, there was no case for further inquiry; and upon this very delicate point the skill of the surveyor came in to determine the matter of fact. Here it was no doubt essentially necessary that the surveyor thus intervening should understand the maxims of the law, such as those which were so ably expounded in Mr. Gardiner's paper, otherwise he would be prone to direct his attention to points of no real moment. With respect to the conflicting testimony sometimes given by professional witnesses in ancient light cases, Professor Kerr said it ought to become an earnest endeavour amongst architects and surveyors to come to some distinct understanding as regarded the principles upon which they should estimate the materiality of damage. It would be known to many that he had attempted to establish, by a geometrical admeasurement of sky area, a preliminary test, if no more, of proportional obscuration; but he was obliged to acknowledge that Mr. Gardiner was right in stating that such efforts had met with little favour in the courts,—the reason, he (the Professor) was accustomed to think, lying chiefly in the fact that the learning of the bench and the bar alike, however profound, did not turn, and could not be expected to turn, very much upon spherical trigonometry. Vertical measurements of obstructions, however, were not uncommon, and he had not found them to be distrusted by the courts, although they were not worth much. A concluding word as to what was termed "direct evidence." A court of law always preferred that kind of testimony, upon whatever subject. The plain story of people who described what they had seen with their eyes and heard with their ears, was naturally esteemed to be infinitely better than the mere opinions of those who arrived at their conclusions by speculation. In cases of damage to lighting, what was this direct evidence? It took the form of various kinds of assertions by such persons as inmates of the plaintiff's premises, to the effect that they had actually by their eyesight perceived the lighting to be materially diminished by the obstruction complained of. He felt bound to say that throughout his experience he had scarcely ever known such evidence to be worth anything at all. The conditions of the atmosphere in this country were so changeable, day by day, and even hour by hour, and the effect of this upon the lighting of a room was so very considerable, that he did not believe any one could trust his mere eyesight as a test in this way, unless in very exceptional cases. He had known gas bills referred to, and the alleged hour of lighting the gas in the afternoon or evening was continually being quoted. To give a single instance of the real value of such evidence. At a certain window in the rear of an eating-house, an old servant had cut ham and beef for some thirty years. A row of houses outside this window was pulled down, and a new building erected in their place. When the new building had reached a certain stage, the operator upon the ham and beef laid down his carvers and declared that he could no longer see to cut. All over the eating-house the gas was lighted early in the day. All this was sworn to; but a shrewd Vice-Chancellor sent some one to measure the walls. It was found that the new building was not yet so high as the old one had been! His (the speaker's) opinion of the whole question of ancient lights, if he were asked to express it in a few words, would be this; that legal acumen was wasted upon it, and that an intelligent and honest surveyor's judgment, taking every case on its own merits, was better than all the litigation in England. He was very much mistaken, moreover, if that was not the opinion of the majority of the Judges themselves.

Mr. E. I'Anson said he had read Mr. Gardiner's paper with great interest, but he was afraid he should not be able to add much to the general stock of knowledge. As to the remarks of Professor Kerr, they were characterised by a great deal of most sound and excellent argument, but did not appear to point to any solution of the difficulties of the question. He (Mr. I'Anson) had now, for the past thirty years, been professionally concerned in a great many cases involving questions of ancient lights, and was more than ever impressed with the difficulties of the subject. He agreed with Mr. Chatfeild Clarke in characterising the subject treated of in the paper as one of extreme professional interest. There was no doubt, as Professor Kerr had said, that frequently, when questions of this sort were litigated, they were promoted in the most grasping, selfish spirit, for the sake of making some paltry profit, to the immense loss of some adjoining owner. As to the conflicting evidence sometimes given by professional witnesses, it was, no doubt, partially to be explained by reason of the natural leaning which the surveyor had to serve his client, partially by the manner in which the surveyor was engaged by his client, and partially by the manner in which his client's solicitor "improved" his affidavits. The real difficulty in all such cases was to say how much light was light enough. The question in all cases was as to the material damage. There could be no doubt, as Professor Kerr showed in his diagrams, that if you obstructed a certain proportion of the arc of a circle you obstructed a certain proportion of light, but it was not true to say that if ten degrees of the horizon or zenith were obstructed, that quantity of light would be obstructed, as the light coming from the horizon and the zenith was not so valuable as that coming at an angle of 45 degrees. It was very difficult to lay down any certain rule by which it could be shown what was the diminution in value of property caused by interference to a greater or less extent with the uninterrupted enjoyment of its ancient lights. He recollected the case of a gunmaker in Whitechapel, who used to prove his gun-barrels by looking down them while they were at such an inclination as enabled the light to shine down them. This was a case where a certain angle of light was absolutely necessary. He thought that the twenty years' occupation worked very hardly indeed in respect of lights acquired by prescription. Twenty years in the life of a building was a very short period, especially as many buildings were put up which would last for two centuries easily. Some modification was therefore necessary. Mr. Chatfeild Clarke had suggested that before a building was erected there should be some competent surveyor appointed to determine what were the facts. That was very well, so far as it went; but he (Mr. I'Anson) thought it would be well if some competent person,—perhaps more than one,—were appointed to say what would be the damage, in their opinion, in the event of certain obstructions, or assumed obstructions, taking place to ancient lights, and informing the person wishing to obstruct of the amount of damage, giving him the option either to pay the amount or to forego his building. The settlement of such cases was beset with great anxiety to professional men, who all endeavoured to arrive at the truth, though the complexity of the subject was so great that it was a matter of extreme difficulty to determine the amount of damage. It very frequently happened that the surveyor did not get the whole of the facts before him.

Mr. Edward C. Robins, in a written communication to the Hon. Secretary, Mr. J. W. Penfold, said he was anxious to press one point, and to hear all the arguments *pro et con.*, viz., Was it not desirable that it should be an established and well-recognised custom that (in towns, at all events) no damage to existing lights should be deemed to have arisen where the building owner kept the front wall, roofs, and all (except chimney-stacks) under a line drawn from the lowest window-sill of his opposite neighbour's premises at an angle of 45° with the horizon? He (Mr. Robins) was surveyor to the Dyers' Company, and conducted the experts' evidence in a case between that company and King, referred to in the paper, and in which that angle was enforced. He had settled out of court many cases upon the same basis, and in a recent case before Sir George Jessel, both parties consented to this mode of decision. Let this once be recognised, and the question of compensation had a basis from which to work, all attempting any rise above that line to be either a subject for compensation or injunction, as the case might be.

A cordial vote of thanks having been given to Mr. Gardiner for his paper, the meeting ter-

minated. The next meeting will be held on Monday, the 24th inst., when a paper on the subject of "Fences in Agriculture" will be read by Mr. Gray, of Dilstone.

ARCHITECTURAL PRECAUTIONS AGAINST EARTHQUAKES.

IN a report addressed to the Minister of Public Instruction in France, M. Lescasse, a French architect and engineer resident in Japan, observes that earthquake-action, and its consequences, have attracted much attention wherever such phenomena are of frequent occurrence, but nowhere more so than in Japan, since the use of masonry for building purposes has been encouraged by the Government of the Mikado.

It would seem that solid walls of masonry, with massive timber roofs and floors, are less secure, and far less durable, than either of the buildings heretofore in use in Japan, or ordinary wooden structures. But the rapid decay of timber in Japan renders it unsuited for large edifices or public buildings.

M. Lescasse's first idea was to use wood, but to replace the portions most liable to decay, such as the wall-plates (Japanese *dodaï*), and the larger stanchions (*hushwia*) with ironwork. The additional expense thus involved proved very heavy.

Some experiments undertaken by him, at the instance of Dr. Murray, before preparing the plans for a large college (*Kaï-suï-gakko*), suggested a method that he ventures to think may prove of service, not in Japan alone, but wherever earthquake-action is prevalent. Whether it is a novelty, pure and simple, is of no great consequence, although he feels bound to state that neither he nor any of his friends to whom he has described it have seen it in use before. What is more to the purpose is that it should be widely known.

Suppose a wall of dry bricks (without mortar) to be built upon a table. If the table is violently shaken the edifice will topple down in all directions, like a house of cards. But let the pile of bricks be bound together in a block with twine, or wire, or hoop-iron, and it will only fall over bodily, backward or forward. The idea thereby suggested was to build in bays, so bonded together that breaches of continuity would be impossible.

To build the walls in bays, formed of stout wooden frames, firmly secured one to another, and to prevent the structures so raised from falling over outward or inward, by using strong transverse frames, firmly united to the former, appears a method at once simple and feasible, and in several cases M. Lescasse has employed it for wooden structures with complete success, notably in the college of the Rev. Father Nicolaï, at Suragee Daï, Yedo.

The application of the same principle to masonry, by employing a surface arrangement of iron cramp-rods, appears equally simple and effective, the more so, as the iron rods are applied in directions where their power of resisting a strain is greatest. The dimensions of the cramp-rods will, of course, depend upon the structure. In Japan, the increased cost thus entailed may be reckoned as 10 per cent. on the prime cost of the wall.

CONSISTENCY AND REFINEMENT IN ARCHITECTURAL DETAIL.

ARCHITECTURAL ASSOCIATION.

IN the discussion which followed Mr. Seddon's paper (see p. 59, *ante*),

Mr. John Sulman said that he was the questioner who at the previous meeting had asked Mr. Burges whether the architect of the present day should aim to be eclectic, and he thanked Mr. Seddon for his reply, which appeared to be "Yes, with certain limitations." If he remembered rightly, he put his question with somewhat the same limitations, believing that eclecticism should not be a jumbling together of odd scraps of different styles, but that, as "heirs of all the ages," modern architects should use the best points of all styles in their work, especially in the best of their work. Mr. Seddon had insisted upon the necessity of common-sense as a basis of all good architecture, but what was common-sense? Were they to take up the vernacular, the ordinary form of speculative building, and endeavour so to refine and beautify it with consistency as to form an architecture of the present? Or were they to go upon the system they had already been pursuing, *i. e.*, taking an old style as a starting-point, and almost torturing their buildings to make them fit the style? It seemed to him that the time had come when the whole matter must be looked at in the face. Probably most of the members present had been working in the Mediæval styles, but it seemed to him to be rather a tendency of Mediævalists to put common-sense on one side if it happened to clash with what they called good architecture. It appeared to him that such was not a proper course to pursue, and that it would be advisable to revert to simple forms which would meet the bare wants of construction, and refine them and make them beautiful with consistency. Of course it was a tremendous task to endeavour to take up hints from various styles and so to fuse them as that they should be consistent; but nevertheless that seemed to him to be the right method. It struck him that it would be advisable in future to take the vernacular or common-sense forms of building, taking one style as a general key-note with which all the architectural details should harmonise. Success seemed to be more easy of attainment by taking one style and modifying it to suit present-day wants, than by seeking to evolve an altogether new style.

Mr. Stannus remarked that, excellent as was Mr. Seddon's paper, it had not gone further than the enunciation of general principles, in the laying down of which probably all would agree, although differences of opinion would arise in the application of those principles. Roman art, it was true, became utterly degraded, but it had a germ of good in it. He did not think Mr. Seddon had been quite just in speaking of the manner in which the Italians in the Renaissance period revived Roman architecture. The buildings of the quattro-cento period, by such architects as Bramante, were possessed of common sense in a marked degree, and for soundness and honesty of construction might have been designed by Mr. Seddon himself. He thought Mr. Seddon had not been sufficiently explicit in pointing out that the characteristics of a style of architecture must to a great extent be the outcome of the kind of materials available. The Greeks had large stones, which enabled them to build in a trabeate or lintel style. The Romans had no large stones, and consequently they were compelled to use semicircular arches in the architectural coverings of masonry to their brick buildings. But in consequence of their great thrust, semicircular arches could only be used when strong abutments were readily available, and this was the reason why in the Middle Ages the monks and religious corporations adopted the pointed arch, which had little or no outward thrust, and therefore allowed of the building of two or three bays at a time, which would have been impossible if semicircular arches had been used. Coming down to the present time, in London we were situated on a bed of clay, and therefore we built principally in brick, and it was certainly not impossible to get good architecture by the use of so homely a material. Indeed, he believed that there was much more good architecture produced when the architect had small means at his disposal; for in lieu of the meretricious carving with which unlimited money enabled him to cover his building, he was obliged to rely upon good proportion and breadth of effect.

Mr. H. L. Florence said that the architecture of the present day corresponded very much with the thoughts and habits of the people of the age. The modern mind was exceedingly complex, and consequently there was a great diversity in our buildings. What we most needed was simplicity, which was, indeed, generally, if not always, synonymous with the refinement Mr. Seddon desiderated. Many buildings were spoiled because their design originally was not sufficiently simple. They were generally overdone, and the paring and pruning down on account of financial exigencies invariably resulted far more unsatisfactorily than would have been the case had a simpler design been kept in view from the first. If the proportions of buildings were more carefully studied, a great many of the defects of which Mr. Seddon complained would be got rid of.

Mr. W. W. Robertson said he was particularly interested and instructed by Mr. Seddon's short and clear analysis of the different periods of architecture with respect to the two qualities of consistency and refinement. Certain periods were characterised both by consistency and refinement. At other periods, consistency was present, though not refinement; while in other periods, refinement was present though unaccompanied by consistency. Much had been said against Roman art; it was undoubtedly lacking in consistency, but did it lack refinement? There would be no difference of opinion as to the fact that, with regard to the architecture of the present day, the qualities of consistency and refinement were in the majority of cases conspicuous by their absence. In considering the matter it occurred to him whether this was not the result of certain disadvantageous circumstances under which the architectural profession laboured in the present day? The present was a period of immense pressure. Every one was anxious to make a name, and there was a temptation to leave the beaten track of excellence and try to do something "striking." The architect newly engaged in practice was too often absorbed in thinking how he was to "strike" the public,—how he was to force himself upon public notice; he felt that he must do something "acrobatic,"—something that would "stun" the public. This was the result of competitions. In a competition, the architect who would obtain the commission must do something "striking"; and even when he might subsequently desire to prune his extravagances he found that he had already spent so much time on the design that he had no time to alter it, at any rate, with any satisfactory results, even if his client were willing to allow any pruning, which he generally was not, thinking that the architect wanted to escape from his bargain if he sought to remove some of the excrescences of the design.

Mr. Elkington, jun., put in a plea for some of the buildings erected in the City as satisfactory adaptations of the vernacular. In some of the large warehouses and buildings of a like unpretentious character, the qualities of consistency and refinement were frequently very well expressed. Of course, such buildings afforded no scope for anything like high art, but they were extremely interesting as showing what could be done with simple materials when the architect had a definite aim before him. In such buildings the question constantly arose as to the best manner of treating constructive ironwork. Could Mr. Seddon give his ideas on the point?

Mr. Lacy W. Ridge said he agreed with Mr. Robertson's remarks as to the demoralising and vitiating tendencies of competitions, which elucidated the very peculiar paradox he had put before the meeting. He said that the architect must do something "striking" to make a name, and that that would prevent him from going in for common sense and refinement. On the other hand, it was constantly being declared that the public did not care a bit about architecture; all they wanted was common sense. This was the reason why, for their ordinary dwelling-houses, they were not only content with, but actually revelled in, the work of the speculating builder; but when they wanted anything extraordinary, or what they were pleased to think must be extraordinary, they invited any number of architects, and unfortunately they got them, to send in designs. These competition designs, as a rule, positively luxuriated in extravagances and excrescences, such as, indeed, an architect would never think of suggesting to a private client. The advice had been given that it would be best to begin with the vernacular; he (Mr. Ridge) thought that was bad advice, because the vernacular was "nasty." If "the vernacular" meant anything, it meant the ordinary run of speculating builders' houses. He advised the student not to begin from the "vernacular," but to go back one stage farther, and begin *de novo* from common sense. They had to deal with doors, windows, walls, roofs, chimneys; let them think what each of these should be, and start from that basis. Notwithstanding the numerous revivals of styles which the last few centuries had witnessed, we were not one iota nearer a new style. While he did not think the buildings of the present generation of architects were worse than those of their immediate predecessors, he could not say that they were very much better. He thought each man ought to work out his designs from one to another, adopting (if in a modified form) what was successful in one design in his succeeding designs, instead of seeking to design something entirely different. If this course were pursued, greater individuality would be expressed in our buildings, and the chances of the evolution of a new style would be far greater. Not that the architect was not to study the works of his contemporaries, for from them much was to be learnt. It had often been complained of that there was no copyright in architecture, but this was not a real grievance, for every architect knew that his subsequent buildings would be better than those he was just putting up. He

believed that if architects were to work more together, and to be more consistent with themselves and with one another, they would make their works more acceptable to the public. Above all, the young architect should never attempt anything "striking," except for a competition. There had been a very unfortunate departure from that principle. There was a style of Gothic really almost free from any defects. It was founded on a sort of domestic Gothic, with, however, hardly any distinctive Gothic elements in it. It was being worked out with great success by men of very great talents; all of a sudden these men rushed off to Queen Anne, and outraged all common-sense and decency, so far as architecture was concerned. But a most fearful Nemesis had befallen them. Could any one imagine a more frightful nightmare than that experienced by a leader of the Queen Anne style when he woke up to the fact that some of his less-gifted brethren were imitating some of his choicest *morceaux?*

Mr. Robertson said he did not mean to say that the public objected to consistency and refinement, but that it required an architect of great genius to make such qualities attractive to the public.

After some remarks from Mr. S. F. Clarkson,

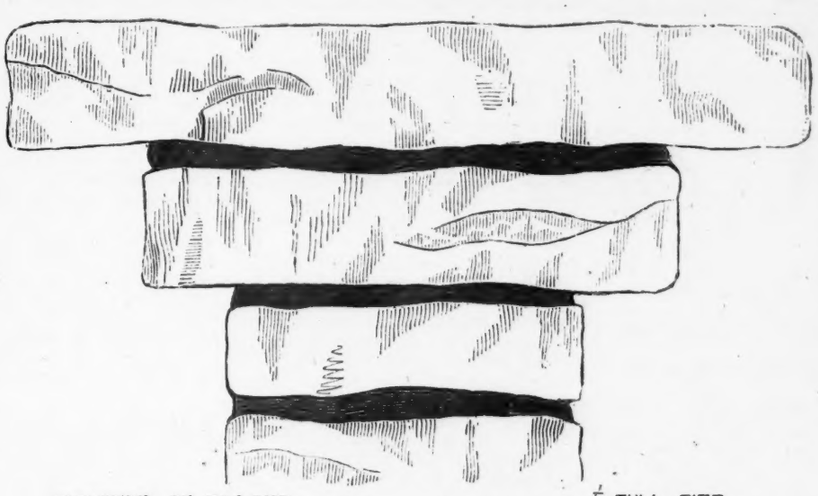
Mr. Seddon, replying on the discussion, said Mr. Sulman had put the matter more admirably and clearly, and perhaps in more courteous terms, than it was stated in the paper. In considering the subject, it was necessary to dissociate it from particular styles. Architecture must be considered as a whole in discussing its consistency or refinement. Although he considered himself a Gothic architect, he was a great admirer of Greek art. As to the trabeate construction of Greek architecture being due to the largeness of the stones available by the Greeks, he thought M. Viollet le Duc had distinctly proved that, on the contrary, it arose from the fact that the Greeks had no large stones except the frustra of the columns, which were rolled to the spot where required. He believed, however, that the Greeks were competent to work in any material which might have come to their hands. They showed the utmost refinement in working out their peculiar needs. The question as to what style should be chosen for working in at the present day was of comparative unimportance. They might, if they chose, take architecture at its height and with its best details, and apply it in a common sense way to the vernacular; or they might begin with the vernacular and treat it as fancy dictated, but care should always be taken to decorate the construction, and not to construct the decoration. With regard to Italian or Roman examples, it was quite true that some had fewer faults than others; but how many details were there, and were they good? He was far from saying that there was no merit in Roman or Italian. No great man could work in any style without showing some good result. Even "Queen Anne" had its merits, which would be worth dilating on. He thought with Mr. Sulman that the best thing to do was to begin with the vernacular and work upwards, avoiding all ornament that was not needed. Ornament should be concentrated, and good of its kind. As to the use of iron for constructive purposes, he (Mr. Seddon) must come to the Association for lessons, for he never used it. He had never used an iron girder in his life, and did not intend to if he could help it, although he believed that if necessary it was capable of some amount of artistic treatment. He decidedly agreed with Mr. Elkington that many City warehouses were often very satisfactorily treated. In conclusion, he acknowledged the vote of thanks which had been tendered to him for his paper.*

* With reference to a note from a correspondent headed "Was it Fair?" in our last issue, Mr. Seddon writes to deny any intended unfairness in the preparation of his illustrative drawings.

ROMAN HYPOCAUST AT BINCHESTER, NEAR TO BISHOP AUCKLAND, DURHAM.

THE Roman work here illustrated requires a little timely attention to preserve it from falling into ruin.

I believe this interesting monument of a mighty people was accidently discovered about thirty years ago, by a laden cart bursting a little of the top in in passing over, and when I visited the place last summer, I found many of the tile pillars missing,—indicated on the plan by B and X; two of these deficient pillars were substituted by recent 9-in. brick piers, which helped greatly to support the floor above. Unfortunately, at this place many of the large tiles forming the caps to pillars had, of course, fallen in, owing to their supports being removed, thus exposing the layer of mortar or concrete floor above,—this floor, happily, retaining its position. When I again visited the place, I found that nothing more had been done to support the roof since my previous visit, and the dilapidation had become slightly worse. A local gentleman who takes an interest in these matters, and who rents the land in which the hypocaust is situated, had previously to my visits creditably put in those brick pillars before alluded to, and marked B on plan, thus doing something towards preserving this interesting memento. There yet, however, remains more to be done before the top is out of danger.



ELEVATION OF PILLARS. ¼ FULL SIZE

Cannot the Northumberland and Durham Antiquarian Society give a watchful eye and helping hand to this precious legacy of a far-away past?

Perhaps I may be permitted, further, to mention a somewhat interesting fact connected with the estate in which the hypocaust is situated,—namely, that it was once owned by a family of the name of Wren,—of the same stock, I believe, as the illustrious architect of that name,—they having occupied a country-seat close to this Roman structure. The estate, after some vicissitudes, was purchased by one of the Bishops of Durham, whose castle was close to it, and who levelled this country-seat with the ground, having, it is said, first quarrelled with the occupants.

THOMAS WEATHERLEY.

THE SOUTH-EASTERN AND LONDON, CHATHAM, AND DOVER JUNCTION AT BLACKFRIARS.

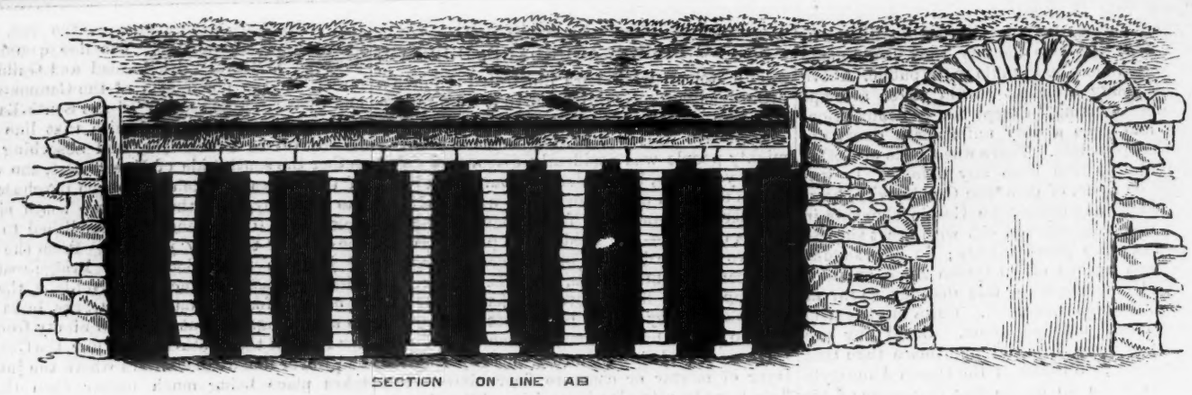
THE new junction line which has been in progress during the year just ended, by the South-Eastern Company, for the purpose of connecting their railway with that of the London, Chatham, and Dover Company at Blackfriars, is now almost completed, and is expected to be opened for traffic early in the spring, when the South-Eastern line will be placed in direct communication for through traffic to the north and north-east with the Midland, Great Northern, and Great Eastern railways, and likewise with the Metropolitan and District lines.

Although the new junction line is under a mile in length, the outlay has been very heavy, not only owing to the amount of property which has had to be purchased, but also to the heavy engineering obstacles which have had to be encountered at some points on the line, more especially at Gravel-lane. The line commences between Southwark Bridge-road and Guildford-street, on the north side of the Cannon-street and Charing-cross section of the South-Eastern Company, running parallel with that line until its arrival at Gravel-lane, and absorbing altogether the south side of Ewer-street, the whole of the houses in which have been purchased by the company, and those on the south side,—upwards of 100 in number,—demolished to clear the site for the new junction. From the point of junction near Southwark Bridge-road, to within a short distance of Gravel-lane, the line is carried forward on thirty arches, built with an ascending gradient of one in ninety from the low level of the South-Eastern line, the Chatham and Dover line at Blackfriars where the junction takes place being much higher than that of the South-Eastern. The whole of these arches are already completed, and ready for the ballasting and the laying down of the permanent way. About twenty yards on the east side of Gravel-lane the new line diverges in a north-westerly direction towards Blackfriars from the Cannon-street and Charing-cross line, being carried from this point to the east side of Gravel-lane by a brick tunnel about thirty yards in length. It is thence carried across Gravel-lane partly by a massive skew bridge, 35 ft. above the street level, spanning the entire width of Gravel-lane, including the footpath, and partly by a girder bridge immediately adjoining the skew bridge on the south side, the abutments on the east side of Gravel-lane supporting both the skew and iron girder portions of the bridge being upwards of 20 ft. in thickness. The foundations for the abutments on either side of Gravel-lane are 24 ft. in depth, filled in with concrete. It was at this point that unusual engineering difficulties were met with. In excavating for the foundations the gravel stratum below the Thames was arrived at, and it was necessary to have an engine at work day and night to pump out the water. The large brick skew bridge over Gravel-lane is finished, and the iron girder portion far advanced. From Gravel-lane the line is continued on a curve, in a north-westerly direction, to its junction with the Chatham and Dover line at Blackfriars, by twelve arches, intersecting Price-street, Union-place, Dyer's-court, and George-street, by lofty arches, several of which are already turned. The height of the several arches at the point of junction, a short distance from the Blackfriars Station, is 44 ft. above the ground level. The joint contractors for the new junction line are Messrs. Lucas and Messrs. Aird, and the works are being carried out under the superintendence of Mr. Brady, the South-Eastern Company's engineer.

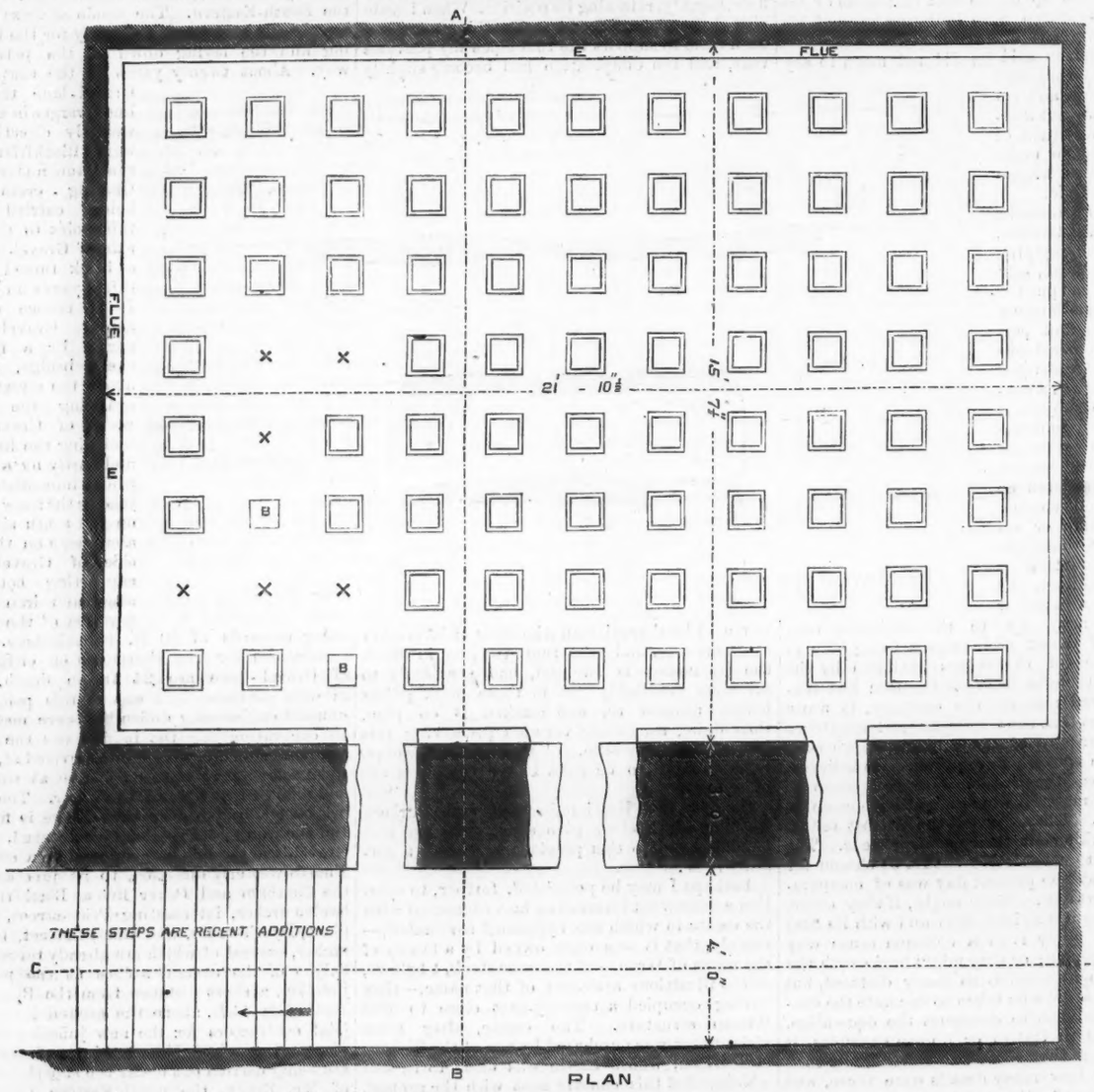
It is stated that the Company contemplate the erection of a goods station on the north-eastern side of Gravel-lane, immediately alongside the new line now in course of formation, and that the whole of the houses on the north side of Ewer-street, now the Company's property, together with other dilapidated property in the neighbourhood, will be demolished for the site.*

Breakages by Workmen at Ironworks.—Mr. Kettle, the County Court judge, has decided at Dudley that where breakages at ironworks occur from the negligence of a workman he may not only be dismissed without notice, but be amerced in damages. Hitherto, ironmasters have patiently borne the consequences of such neglect, and the case in which this decision was given is the first of its kind, and therefore noteworthy both for masters and men in the iron trade.

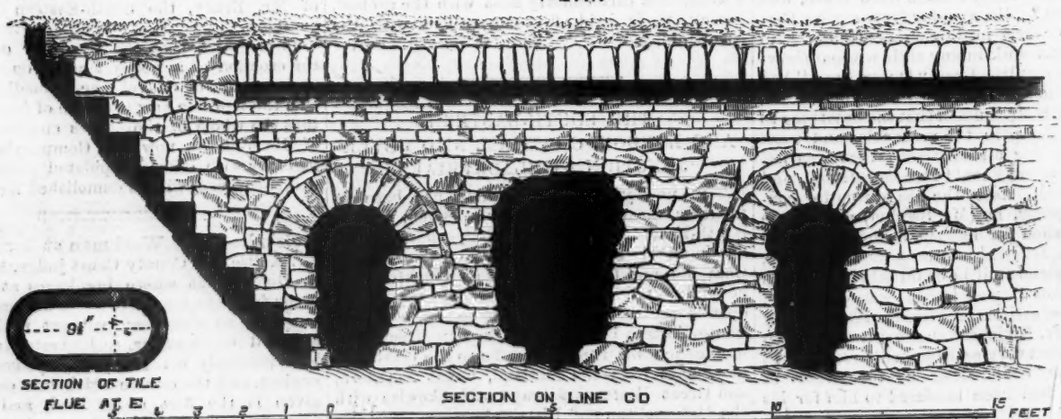
* The miserable condition of this part of Southwark long continued, has been described and illustrated in our pages. See, also, "London Shadows," by Geo. Godwin 1854; pp. 74 to 79.



SECTION ON LINE AB



PLAN



B. Indicates recent 9 in. brick supports to roof. X. Marks where pillars are missing, and where the superincumbent work is destitute of support.

ROMAN HYPOCAUST AT BINCHESTER, DURHAM.

ROOD SCREEN AT LIERRE, IN BELGIUM.—*Circa* A.D. 1520.

ROOD SCREEN AT LIERRE, BELGIUM.

THE pretty little town of Lierre is situated about twelve miles from Antwerp, on the road to Mechlin. Although a place of no great importance, yet it is tolerably prosperous and fairly populated. It contains a town-hall of the last century, attached to which is a plain but very picturesque *beffroi*, dating from the fourteenth century.

There are eight or nine churches, several of which are interesting to the antiquary and architect, but one of which is really a most splendid structure: we refer to the Church of St. Gomaire. A picturesque old Béguinage and a curiously-vaulted hall on the market-place complete the achæological attractions of Lierre.

The Church of St. Gomaire, or Gommaire, is a magnificent cruciform building, consisting of a nave and aisles of seven bays, two of which form the lower portion of the great western tower; very deep transepts, each of four bays; and a noble choir, surrounded by aisles, with a *chevet* and seven radiating polygonal chapels. There are vestries on both the north and south sides, and one chapel, of two bays, opening out of the north aisle of the nave.

Externally the Church of St. Gomaire is very plain, but dignified and striking, from its great height, the massive flying buttresses which support its clearstories, and the number of radiating chapels which surround the apse. Unfortunately the great western tower, which was commenced in the year 1436, and completed in 1453, by the erection of a lofty spire of wood, covered with lead, was struck by lightning in the year 1702, and the upper story or octagonal lantern had to be rebuilt. This was done in the most hideous manner, and an ill-formed and most unpicturesque capping now replaces the ancient spire. There is a western portal below this tower, but the sculpture which originally adorned it now no longer exists; probably it was so injured by the destruction of the ancient spire that its removal was rendered necessary.

Few churches in Belgium present a more beautiful interior than the church of St. Gomaire. Its proportions are wonderfully good; the aisles are divided from the nave by well-moulded arches supported upon circular columns with polygonal abaci and bases. Above is a very wide triforium of open tracery, and a lofty clear-story containing windows of six lights, except in the apse, where they are reduced to two lights. Between the nave and choir is the magnificent rood-loft shown in our engraving. All the other fittings in this church are in the Renaissance style of architecture, of which they are good examples, and show how well fittings of this style harmonise with Gothic buildings, and if any one will compare the interior of this church, where the Renaissance fittings have been retained, with the interior of the great church at Courtrai, where they have been removed and replaced by Modern Gothic ones, he will at once see that *old* Renaissance work harmonizes better with ancient Gothic than *modern* Gothic does, although the latter is supposed to be a careful imitation. Perhaps the fact that it is an *imitation* makes it look so incongruous when placed in juxtaposition with ancient work; whereas the boldly distinctive character of these Renaissance fittings rather delights us by its contrast, and certainly adds greatly to the picturesque effect of the buildings which it adorns. Thus one is often tempted to sketch a bit of a Belgian church with its fourteenth-century arches and vaulting, and a Renaissance altar stuck against one of the columns; but who would care to make a sketch from the same point of view if the Renaissance altar were to be replaced by a modern Gothic one, however good it might be in design?

It is probably the fact that all the Renaissance fittings have been preserved in the church of St. Gomaire that makes its restoration the most successful one which we have seen in Belgium; and, we are sorry to have to say so, this restoration was carried out, not only without the aid of an architect, but *in direct opposition to the advice of the architect consulted.* We cannot give our readers a better idea of this curious state of things than by quoting the words addressed to us by the venerable dean of the church. His account was as follows:—"I had an architect sent to me by the Government, but before placing this fine church in his hands, I determined to ascertain what he intended to do. To my astonishment he told me that 'as the church was in the Gothic style it was necessary to remove every feature which was not in that style.' 'What,' said I, astonished, 'you would remove these fine altars of marble, these beautiful statues against the columns, these costly and splendidly carved screens? No; I will not have one of them touched. My church is a museum of sacred art, and you have no more right to destroy features in it which are of a later date than the rest than you would have to turn all the coins out of a collection because they happen to be of a later date than the time of Augustus. No; if I am to leave my mark upon this church it shall be by adding something to it, not by destroying the works of my predecessors.' And so my architect left me in disgust, and I called in an intelligent mason, and I said to him, 'Scrape all the whitewash off the walls of this church. These windows have been robbed of their tracery, copy the existing ones on the other side,'" &c.

Now we do not mean to recommend this plan, but as Sir Gilbert Scott pointed out at the opening of the present session of the Institute, and as we ourselves have often done, it is terrible to think what harm can be effected by an architect who regards destruction as an essential part of restoration.

The dates of the various portions of the church of St. Gomaire are fortunately well known, and have been carefully ascertained and recorded by Professor Schayes. They are as follow:—

First stone laid in	1425
Nave completed (except the vaulting)	1443
Transepts commenced	1460
,, completed (except the vaulting)	1475
Chancel commenced	1473
,, completed	1515
Vaulting of nave and transepts completed	1557
Western tower commenced	1436
,, ,, completed	1453

The remarkable rood-screen bears the arms and motto of the Emperor Charles V., and was evidently erected in his time, probably very shortly after his election to the Empire [A.D. 1519]. It is composed of a very fine white stone, except the columns, which are of black marble. The tall shrine upon it is a remarable feature, and serves as a kind of monument to the patron saint, whose works are represented in the alto-reliefs which adorn it, and whose statue fills the large niche forming its upper story. There is some fine old stained glass in the windows of the choir and transepts, dating from the earlier part of the sixteenth century; and there are remains of decorative painting on the vaulting of several of the chapels. This was brought to light by the removal of the whitewash. Many of the altars have fine pictures enclosed in the reredoses, one of which is ascribed to H. Memling.

CRYSTAL PALACE RAILWAY STATION.

THE rapidity with which the railway system has increased since the rail and the locomotive—man and wife, as George Stephenson pronounced them—were married fifty years ago, is a trite topic. There are some kindred subjects to which less attention, perhaps, than is their due has been given, such as the expanded and elevated ideas that have led to the developments and improvements in the railway system in connexion with permanent way, rolling-stock, stations, and, indeed, in all departments.

In permanent way, iron rails of 20 lb. to the yard have been superseded by rails of from 70 lb. to 90 lb. per yard, and by steel rails of, in some cases, 90 lb. to 100 lb. per yard. The locomotive engines first run on the Liverpool and Manchester Railway weighed, with their charged tenders, 7½ tons. Nowadays engines are built that, with their loaded tenders, weigh as much as 60 tons. In the early days, when but few locomotives and railway-carriages were in existence, each engine and carriage had its distinctive name, such as the "Rocket," the "Locomotion," and the like, for the one class, with the "Experiment," the "Good Intent," &c., for the other. The catalogue of heathen deities was speedily exhausted in locomotives named after Jupiter, Mercury, Mars, &c.; and even the names of countries, capitals, counties, and less-imposing localities "gave out"; and the names of qualities and objects, animate and inanimate, failed to supply titles to the engines and carriages of companies that have numbers that run into four figures in several classes. Simple progressive numbers were hence resorted to, and now every company has its engines, tenders, carriages of each class and wagons, trucks, &c., registered under its simple progressive number. This, however, is a matter of much less importance than the character of the accommodation provided for the public. In the beginning railway carriages were, for the greater part, most uncouth and comfortless vehicles, the third or fourth class carriages were "stand-up" boxes on wheels, little or no better than cattle-trucks. From these there has been a *crescendo* improvement from third-class carriages that may be seen on the Crystal Palace trains of the Brighton Company, with stuffed seats and backs, and parcel nets overhead, to the luxurious and superb Pullman's drawing-room and sleeping-cars. Several of the companies that run trains out of London have now third-class carriages that are little inferior to the first-class carriages of forty years ago. So it has been also with railway stations that were a few years ago, in many places, mere wooden shanties. Stations have developed wonderfully of late in the magnitude and grandeur of principal termini, and also in the style and amplitude of accommodation of subordinate stations. The works recently completed and in progress in connexion with the Crystal Palace stations of the Brighton Company are notable illustrations of this.

At the Crystal Palace low level station the platform accommodation and the spacious flights of steps to the high level have left nothing to be desired, excepting, perhaps, in so far as that part of the station is concerned, more light after sundown, and shelter from piercing winds, that it would be difficult, it may be, to provide. The accommodation between the landing from the platforms and the entrance-turnstiles has always been of the most inadequate character, as many thousands of visitors have experienced who have gone through the horrors of egress on an extra night. Now that the company have put their hands to the work, they are doing so in a liberal spirit. The station is being entirely rebuilt, at a cost, we believe, of about 13,000*l.* The bridge over the railway, upon which the station is built, is widened by 10 ft. to the rear. The substructure consists of strong piers and ranges of flanged wrought and cast iron girders, with jack arches of 9-in. brickwork thrown between, and levelled up with concrete. The accommodation to be provided consists of a general waiting-room in the centre, 69 ft. long and 35 ft. wide. At each end of this room is a large block of building with two floors. The approach to the Palace is by two corridors, each 41 ft. long and 11 ft. wide. The first and second class ladies' waiting-rooms, each provided with lavatory, &c., are 23 ft. by 15 ft., and 18 ft. by 17 ft. respectively. On nearly the site of the present buffet a spacious dining-room will be provided, and, near it, a much-enlarged refreshment-bar. A cloak-room, 20 ft. by 15 ft., adjoins one of the entrance corridors. The first floor over the corridors, cloak-room, &c., will contain a second dining-room, 28 ft. long and 17 ft. wide, with kitchen and other conveniences. In the opposite block are the booking-offices, a telegraph-office, and the ladies' waiting-rooms. The first floor over these has the station-master's rooms, which embrace a living-room, four bed-rooms, kitchen, &c. In front of the station the carriage approach terminates under a covered space of 70 ft. by 40 ft., divided into five bays, the roofs supported on ranges of ornamental columns. The roof of this spacious portico is glazed from ridges to gutters. The general waiting-room has a very handsome domed roof, with cast-iron principals and ornamental spandrels. It is crowned by a lantern, 4 ft. high by 12 ft. wide, glazed all round. Both of the two-story buildings have mansard roofs, the one nearest the Palace grounds, which is of very high pitch, will be covered with zinc; the other is slated, and each is finished at the top with an ornamental iron railing at the base of the crowning square. The side lights to the new buildings are by coupled windows, with arched heads.

Mr. F. Dale Banister is engineer-in-chief, and Mr. Mannering his principal assistant. Mr. White, of Croydon, is contractor.

Startling Statistics.—The *Sheffield Telegraph* publishes a series of statistics, obtained from the official records of the Sheffield Consulate, showing that one leading branch of the local trade with the United States,—the Bessemer steel rails,—has entirely collapsed. Not a single ton of steel rails has been sent from Sheffield to the States for nine months! In the first three-quarters of 1874 the total declared value of steel rails exported from Sheffield to the States was 356,180*l.* In the last quarter of 1874 the value fell to 1,156*l*! In the first quarter of 1875 the value was 2,301*l.*, and since that date the trade has been a thing of the past.

THE GREAT NORTHERN COMPANY'S KING'S CROSS STATION.

AMONGST other improvements and extensions which the Great Northern Railway Company have for some time been carrying out at their King's Cross Station, is the formation of a large dining and refreshment room, which has just been completed, and which has necessitated the absorption of several of the company's offices. The spacious area, 60 ft. square, now forming the principal dining and refreshment room, has been entirely reconstructed and finished. The walls are in panels, painted and gilt, between which are ornamental pilasters, and a dado, 4 ft. in height, is carried round the apartment. The ceiling, which is coved, is also in panels, which are uniform with the mural decorations, and the coved portion is supported by consoles representing the figures of griffins, between which are gilt enrichments, picked out in varied colours. Near the centre of the apartment an ornamental screen separates the refreshment department from the dining-room, the latter occupying about two-thirds of the entire area. There are also retiring-rooms and lavatories in immediate connexion. The whole were designed by the company's architects, and have been executed by Messrs. Cubitt & Co. The station has also been enlarged on the west side in order to give increased accommodation for the local and metropolitan traffic. This enlargement consists of an additional double line of rails running parallel with the main line platforms to their entire length. On either side, and also at the south end, there are spacious platforms, and the new or added station area is approached from the main line platforms by two spacious passages, 17 ft. in width. The walls of these passages have an ornamental appearance, being faced with red, white, and blue brick. New booking-offices at the south-west side of the station have been erected specially for this section of the company's traffic, whilst an entirely new block of buildings has also been erected on a site between the main line platforms and the new station, containing the offices in connexion with the general manager's department, and new offices of other servants of the company, who were displaced by the construction of the new dining and refreshment room above described. Further westward a large engine-shed has been erected, and on the land adjoining, which the company some time ago acquired, and cleared of upwards of 200 dwellings, a number of sidings are about to be laid down for shunting purposes, and to relieve the present crowded state of the station. When all the intended works are completed the area of the station will be increased to the extent of more than four acres.

It may be added that in addition to the enlargement of the station other works of an important character between King's-cross and Finsbury Park are in progress. In order to facilitate the traffic between these points an additional double line of rails is being laid down, involving the doubling of the Maiden-lane tunnel near the station, and the Copenhagen tunnel at Holloway. This portion of the work amounts, in fact, to the construction of two new tunnels, with heavy excavations and engineering work.

A LARGE NEW SKATING-RINK AT CAMBERWELL.

ANOTHER new skating-rink, said to be the largest in the metropolis, is about to be added to the numerous establishments of this character which are in such rapid succession being opened for the recreation of the public. The site upon which the new rink is being constructed is in Camberwell-new-road, near the Green, immediately to the east of the railway, and conveniently situated within a few minutes' walk from the station. The building in connexion with it has a frontage to Camberwell-new-road, 60 ft. in length, and consists of the ground floor and story above, surmounted in the centre by a pediment enclosing a tablet in Portland stone, on which will be the following inscription: "The London Skating Rink." The central entrance leads to the hall and staircase to the upper floor, from which is approached a spacious balcony or gallery overlooking the skating-rink area, for spectators. The gallery will also be approached by a flight of stairs at the west side of the rink, and is the only part of the establishment where smoking will be permitted. On the right and left of the entrance are the ladies' and gentlemen's retiring-rooms. On the west side is the refreshment-room, and on the east side the repository for skates. The upper story contains the manager's residence.

The rink, which is approached from the rear of the building, is 260 ft. in length, and 92 ft. in width, and contains the large area of about 24,000 superficial feet, surrounded by a wall 10 ft. in height. In forming the foundation for the floor of the rink earthwork has been excavated to a depth of several feet, and the excavated space afterwards filled in with gravel. Over this there is a thick layer of concrete, the face of the floor being in asphalte, which will be laid down by the Val de Travers Company. The rink on each side, and at the north end, will be covered in to the extent of 15 ft. in width, by an ornamental roof, supported upon iron columns, about 12 yards apart, leaving an open area in the centre about 240 ft. in length, and 62 ft. in width. The covered portion is intended to be used in wet weather, and also in summer when the heat of the sun is oppressive. At the north-east angle there will be an orchestral platform for a band, which is intended daily to enliven the skating exercises.

The architects are Messrs. Bailey & Young, and the contractors for the building, enclosure walls, and foundations, Messrs. Kirk & Randall, of Woolwich, and Mr. Male, respectively. The ironwork and roof of the rink are furnished by Messrs. Brady & Son. Mr. H. Plowman is acting as clerk of works. The rink is expected to be finished and opened to the public about the beginning of March next.

HOMES FOR THE MIDDLE CLASSES.

THE *Morning Advertiser* says:—We are glad to notice that the *Builder* advocates the erection in London of houses in flats for the middle classes. Houses of this description have already been built for the rich and the poor, but no effort has yet been made to supply similar accommodation for the large number of persons belonging to the middle class who cannot find house accommodation at a moderate rental in London, and are now forced to live in apartments, if they wish to remain a short distance only from their places of business, or to take a house in a suburb which they can only reach after a long and tiresome railway journey. . . . . How much better in a sanitary point of view such flats would be for the inmates, than many of the suburban dwellings, the *Builder* has clearly pointed out. How much better would such a flat be for a family of small means than one of those dwellings which our admirable contemporary speaks of as "a slice in one of those rows of small suburban street houses, with bay-windows repeated in 'damnable iteration,'" which "are the work of speculating builders," and are "flimsily and cheaply built of bad materials, and are too often almost criminally deficient in sanitary arrangements!" The new class of town houses to be built in flats which the *Builder* suggests "do not imply immense hotel-looking blocks of buildings, with innumerable stories, but houses of a moderate size, so built and arranged as to accommodate a separate family conveniently and privately on each separate floor"; and there is no doubt that these houses could be built without much difficulty, and that they would let very readily. There is, indeed, at the present time a demand for houses in flats for middle-class persons, and building societies and investors will do well to direct their attention seriously to the plan the *Builder* has so sagaciously recommended. Some persons may object to the project, under the idea that flats would be more noisy than separate residences; but this objection need not be heeded, as sounds cannot be transmitted from one floor to another if a layer of concrete or some similar material is placed between them. There is a great advantage to a family in having all the rooms it occupies on one floor. Less fatigue is incurred in passing from room to room than in running up and down stairs; and as a large amount of labour is thus saved, a smaller number of servants is required to attend to the wants of the family. Where three servants are now required to attend in a house, two only would be necessary for the same family in a "flat"; and where two are now required in a suburban residence one would be found to be sufficient, if a middle-class "flat" residence were occupied. The wife would therefore be more like the mistress of her home than many a wife is at present; she would be able to watch and to protect her children more effectually against such accidents as arise from the ignorance or neglect of nurses; and the great domestic puzzle of the day, the difficulty in procuring good servants, would become less perplexing, as fewer servants would be employed. There would be gain both as regards economy and comfort, if the middle classes were to live in the flats of such houses as the *Builder* has suggested; and amongst the gainers by the new system would be many members of the journalistic and other professions. The practice of living in flats exists to a large extent in Edinburgh and some other Scotch cities and towns, and it answers admirably. The flats in Victoria-street and other fashionable parts of Westminster are eagerly sought after as town residences by members of Parliament and wealthy citizens; and we are certain that houses in flats in less expensive neighbourhoods, and designed for persons of moderate means, would be as quickly tenanted. There are few men who have lived in good suites of chambers who do not contrast unfavourably with them the houses they are compelled to occupy when they get married and settled; and when we compare the simplicity and convenience of the arrangements of good chambers with the complexity and inconvenient arrangements of many small suburban houses, we must own that the latter lose by the contrast. We have no hesitation in saying that if houses were built in London on the plan the *Builder* has suggested, a great many professional men with limited incomes, who do not marry at present because they believe their incomes are insufficient to keep up suburban houses, which must either be very costly or very uncomfortable and undesirable, and of a class which would horrify marriageable girls who had been reared in comfortable middle-class homes, would be lured from their cosy little "dens" or chambers in the Inns of Court and elsewhere, and speedily converted into happy and comfortable Benedicts. Many of these young professional men do not attempt to marry, simply because they are not in a position to provide comfortable homes in London for the ladies they would desire to make their wives; and they feel that they are not justified in devoting a large portion of their earnings to the payment of rent for a rickety suburban house, which is heavily rated, is often out of repair, and is anything but what its landlord describes it to be, "a desirable residence for a small family."

THAMES FLOODS PREVENTION.

IT would appear, happily, that the recent disastrous floods are not to be without permanently beneficial results, judging as evidence of this from the important provisions of the "Thames Floods Prevention" Bill that is to be brought before Parliament in the approaching session. The objects of the Bill are the appointment of Commissioners, who shall have powers to construct and make such embankments, channels, sluices, flood-gates, and other works, in and about certain areas, as shall fit them for the temporary reception of the extraordinary flood-waters and high tides of the River Thames; and as may be required for freeing such areas from such flood-waters on the subsidence of the tide. The limits of the Act are from Hammersmith to Plumstead, including both sides of the river, but it seems to be intended that the Commissioners shall have powers to execute works for the purposes of the Act lower down the river than Plumstead. The areas on which it is proposed to form these temporary receptacles—they are not designed to serve the purpose of reservoirs—are portions of Rainham, Wennington, Aveley, and West Thurrock marshes, in Essex; and portions of Plumstead, Erith, Dartford, and Stone marshes, in Kent. It may seem, on a superficial glance, that the construction of receiving-basins in these localities is not likely to prove of advantage to the inhabitants of Lambeth and other low-lying, thickly-populated districts higher up the river. It should be borne in mind, however, that the flooding of houses and lands is caused by the conjunction of the flood land-water and the tide, and that just so much water as will be taken in by these receptacles will be arrested in its destructive progress up-stream with the rising tide. Of the Commissioners, one-half are to be appointed, and the other half elected. Each of the following bodies shall be entitled to appoint two Commissioners:—The Metropolitan Board of Works; the Mayor, Aldermen, and citizens of the City of London; and the Conservators of the River Thames. Each of the local authorities within the limits of the Act shall be entitled to appoint one Commissioner. The qualifications for being electors of Commissioners are owner-

ship or occupation of a wharf or other property within the limits of the Act, having a frontage to, or water communication with, the Thames, and being liable to be rated for the relief of the poor in respect of such property. Persons qualified to vote for Commissioners shall be qualified to be elected Commissioners. No Commissioner shall receive any remuneration, or hold any office of profit under the Act. The Commissioners may make yearly assessments for the moneys required for the purposes of the Act. The estimate of expense for the works indicated in the Bill is 150,000*l.*, and the estimated revenue 15,000*l.* per annum.

THE COMPANY OF GLASS SELLERS' EXHIBITION, ALEXANDRA PALACE.

SIR,—May I take the liberty of directing attention to the above exhibition (which closes, I believe, on the 31st), with especial reference to the stained glass department. It would be as well, perhaps, here to explain that the writer is himself an exhibitor, and therefore his statements will be accepted with what reserve may be considered prudent. Next you will, doubtless, grant my sincerity when I confess that, though an exhibitor, I am not proud either of the quality or extent of the exhibition. On the contrary, I am rather ashamed of it. The company or guild in question very kindly undertook the responsibility, trouble, and expense of the whole affair, for the laudable purpose of encouraging the artisan to display his individual ability in his craft, and by originality of conception or skill in execution to throw some definite light on the question of the English workman's alleged deficiencies in art-knowledge, æsthetic feeling, and technical skill. I sincerely trust no art patron, or even "intelligent foreigner," will take this exhibition as in any sense a reply to that question, much less a solution of it, as he would thereby do a gross injustice, not only to the artisans whose exhibits have been either *skied* or *floored*; but to the greater number of art-workmen who, from various reasons, have not exhibited at all. In fact, the Glass-sellers' Company have been very ill-rewarded for their good intentions. Their first invitation, by accident or design, or both, was so little known throughout the craft that, in order to get exhibitors at all, they extended their time another three months, and the result then, or rather now, is a miserably meagre collection. This, however, is much more the workman's misfortune than fault. The time of year chosen is most unpropitious, and inconvenient, and if that was not generally known, at least one would have supposed that any one at all connected with stained glass would have chosen in preference any other period of the year than its shortest and darkest days for such an exhibition, wherein the exhibitor himself, in addition to the desertion of the *buying* public, has but a couple of hours of dubious light on four Saturday afternoons to enjoy the company's munificent gift of a *free pass* for a month. Be this as it may, one cannot well blame the Glass-sellers' Company for acting like the indignant host in the parable, and, failing the invited artisan, on whose behalf the feast was originally or ostensibly provided, calling in the halt, the lame, and the blind,—in this case most effectively represented by an incongruous collection of small masters, who, like most make-shift guests, have coolly elbowed all the little people into the dark corners, and have quietly and comfortably settled themselves down in the best lights, for the display of a wondrous and a motley show,—from the emblazonment of a big trade advertisement done in the prettiest pinks and violets imaginable, to an indescribable something like a menagerie after an explosion, with the bits cleverly stuck together again. The treatment I refer to is amusingly illustrated in the very first compartment on entering. The light is not good at the best; but here the centre light and on the line the space is filled with several specimens of geometrical lead work, filled in with plain glass, by a firm who call it, as plain as the glass itself, specimens of ANTIGUL work, meaning, doubtless, antique, but not stooping to common legibility of writing; this is interspersed with some common public-house embossed panels. These unique works of art, which would have borrowed enchantment, with advantage, from distance, displace some of the best specimens of workmen's work in the whole exhibition, including, I think, the only examples of *originality* of design. This kind of treatment is carefully carried out in the other window compartments till it culminates appropriately in a series of meretricious panels of flowers, a large portrait being placed just where two smaller portraits should be (the latter by a workman), which two are as far above the one in merit as in actual altitude,—at least, in my opinion. All this is, of course, entirely apart from the question as to whether employers are fairly eligible to compete, on equal terms, for prizes in an artisans' exhibition. Finally, I would be understood to respectfully beg your impartial attention to the merits and demerits of this small exhibition. I consider it painfully evident that nothing is more urgently needed than that some high and indisputable authority, like your influential paper, should, with kind judiciousness, but withal with justice, point out to most of us, including my audacious self, the right direction in which we should aim for the cultivation of style and the education of a purer taste. And whether we have the manifold advantages of a master, or the more inadequate opportunities of a workman, I fear this exhibition is a too clear indication that most of us have yet to learn how, consistently and artistically, to design and paint stained glass.

AN EXHIBITOR.

SAXON MEMORIALS.

AT a recent meeting of the British Archæological Association, Mr. J. T. Burgess, of Leamington, exhibited a large and valuable collection of Saxon remains recently exhumed from gravel diggings at Longridge, near Warwick. These consisted of a gold *bractea*, 2¼ in. diameter, stamped with rude conventional animals, several pairs of disc-shaped fibulæ with interlaced patterns, portions of a silver *bractea*, unique, two very large cruciform fibulæ, gilded and enamelled knives, long straight swords, a number of umbones, of the usual types, some with inside grips, portions of wooden buckets, with a textile fabric adhering to the wood in one instance, a string of rudely-shaped claret-coloured amber beads, pins, and portions of rough pottery with stamped ornamentation in rectangular panels. Mr. Burgess's description of the finding of these objects was listened to with great attention, and his mention of a quantity of human lower jaw-bones, all with unusual elongation of the chin, deserves to be investigated by comparative palæontologists.

ILL-TREATMENT OF AN ARCHITECT.

LIVERPOOL ARCHITECTURAL SOCIETY.

AT the meeting of the Liverpool Architectural and Archæological Society, on the 12th inst., Mr. Joseph Boult, the president, in the chair, Mr. C. O. Ellison, architect, exhibited a large coloured drawing of Douglas, Isle of Man, showing the Loch Parade improvement. Mr. Ellison stated that he merely exhibited it in accordance with the usual invitation given to members to exhibit anything of interest, and he thought the members might like to see the drawing. He had no intention to make any remarks respecting it, but perhaps at some future time the whole subject might be brought before the Society.

The President said this was the first time that he had seen the drawing. He had read the correspondence with regard to the exclusion of the name of Mr. Ellison from the scroll on which the names of those who took part in the construction of the work were recorded, and it certainly was very remarkable that the name of the gentleman whose design had been adopted, and which was made the rallying cry in a very long and tedious dispute as to which line of improvement should be adopted, that his name and his claims to recognition should be ignored in public documents by the body having charge of the work. The Board in the Isle of Man had endeavoured systematically, as far as he could understand the correspondence, to ignore Mr. Ellison's claim to recognition in every possible way. It was true they formally appointed him their architect and surveyor, but in the correspondence laid before the Society they had endeavoured to reduce his remuneration to the lowest possible amount, and in that correspondence the utmost ignorance was shown of an architect's employment, and of the courtesy and consideration to which he was entitled. Except as regarded the correspondence which he had seen, and the information which he had received from people who had been to the island, and what he had seen in the papers personally, he (Mr. Boult) had no knowledge on the subject; but one of the referees to whom the various competing plans were submitted a few years ago, had told him after his return from the island that there was not the slightest doubt Mr. Ellison had been very badly used by the Manx people. With regard to Mr. Powell, the engineer, the less he (Mr. Boult) said on the subject the better. If a professional man could so far forget what was due to his own position he was not likely to contribute to what was due to the position of other professional men; and he (Mr. Boult) was extremely sorry that any person calling himself an engineer, and occupying the position Mr. Powell had occupied in the harbour works of Douglas, should condescend to act the part he had taken on the occasion referred to.

Mr. J. A. Forrest said he regretted exceedingly that the Manx people had put themselves in this position, and more especially as he understood that Mr. Ellison had not been paid a single shilling for his work.

ADDITIONAL WORKS AT THE BROOKWOOD LUNATIC ASYLUM.

VARIOUS structural alterations and additions have lately been made at the Surrey County Lunatic Asylum, Brookwood. The works comprise enlargement of the laundry and chapel, so as to double their accommodation, and the addition of new workshops, a cottage hospital, a ward for 100 male patients, and a detached block for 300 females. The cottage hospital will afford room for sixteen patients. The new female block contains four distinct wards, two on the ground-floor and two on the first-floor. Passing into the block from one of the main passages, the visitor enters a corridor, 12 ft. wide and nearly 70 ft. in length, having single sleeping attendant's room, scullery, and stores in one niche, and in the other a projecting bay, with windows looking out in the front. This terminates in a large day-room, situated at the angle of the building, 45 ft. by 30 ft., with three bays. From this runs a short corridor, with small patients' and attendants' rooms, terminating in a bay, containing a door leading to an enclosed airing-court. At the extreme ends of the ward are staircases, alongside which, and situated in a small projecting tower, are the water-closets, constructed by Herring & Son, of Chertsey. Within the same area are slop-sinks and lavatories, for day purposes. All the wards are plastered, and the day-wards are 14 ft. high from floor to floor. They are heated by open fireplaces, constructed by Herring & Son. The back of the grate forms part of a narrow chamber, which, communicating at its lower part with the external air by means of a conduit-pipe, terminates below the mantelpiece in openings, through which heated fresh air is constantly being passed into the ward. Flanking the central portion of the building are two towers, at the base of which are the principal entrances to the entire structure, and they contain small rooms, high-level water-cistern, and act as ventilating-shafts. One of them, terminating in a spire and vane, is extended to a height of about 130 ft., and contains a clock, with four dials, striking the hours and quarters. The central portion of the ground-floor contains the dining-hall, 80 ft. by 50 ft. (with large projecting bays), in which the whole of the patients will take their meals. Centrally placed is a large serving-counter, behind which is the opening into the scullery. In the rear of this is the kitchen, fitted up with a large Benham's apparatus.

The plans were furnished by the county surveyor, Mr. C. H. Howell, in concert with the medical superintendent, and have been carried out by Mr. Chappell, of Steyning, Sussex.

LONDON POPULATION STATISTICS.

THE Registrar-General, in his recently-published "Abstracts of 1873," estimates the increase of London population in the ten years 1861—1871, at the rate of 16·1 per cent. It was 23 per cent. in the west districts, but all the increase occurred in Chelsea and Kensington, as the population declined in Westminster, and was stationary in the great district of St. George, Hanover-square. The north districts increased by 22 per cent.; but among them Marylebone declined, St. Pancras increased only 11, while Islington increased 38, Hackney, 50, and Hampstead, 69 per cent. The population of all the

central districts, extending from the Strand to the City, decreased 13 per cent. The law-courts, railway-stations, and offices, have displaced dwelling-houses. The east districts, with the exception of Bethnal-green, Mile-end Old-town, and Poplar, were stationary or decreasing. The increase of London was greatest in South London, which, low and flat, has benefited so much by the new system of drainage, and, lying near the Thames, is convenient for many manufacturing processes. Lewisham, Camberwell, and Wandsworth, still thinly inhabited, increased 61, 56, and 78 per cent. in the ten years preceding the census. The density of population in London was such, that there were 25 persons to an acre in 1841, and 42 in 1871. The density in the thirty years doubled in the west, north, and south districts. In the central districts it declined from 172 to 150. It is a general law that the mortality increases with the density, and this would no doubt have been observed in London had it not been for the increased purity of the water supply, the new system of drainage in operation, and some improvement in the method of lodging people.

The violent deaths show no diminution; they have progressively increased from 2,247 in 1861, to 2,843 in 1873. There is little increase of homicide or suicide, and a decrease of executions. The Registrar-General remarks that while one execution excites great feeling, and a murder finds ample report in the journals, it is left for weekly tables to tell that on an average 45 people of both sexes, and of all ages, are killed by negligence or accident in London every week.

SIR CHRISTOPHER WREN AND HAMPTON COURT.

PRESERVED among the old Treasury documents, which are now open to public inspection at the Record Office, is a curious paper drawn up by Sir Christopher Wren, and endorsed by him,—"Estimat for finishing Part of Hampton Court." It is dated the 28th of April, 1699, and addressed to William III. The portions of the Palace for which Wren's estimate was asked seem to have been the Great Stairs, the Guard-chamber, the Presence-chamber, Privy-chamber, Drawing-room, &c., Lobby and Gallery for the pictures. Sir Christopher writes,—"That although a perfect estimate of Finishing the Inside of any house is as uncertain as the charge of Furnishing, and is more or less according to the intention of the Owner; yet upon supposition that Your Majesty would finish as decently as the greatness of the Rooms seems to require," he considers it proper that the Great Stairs be made with steps of the Irish stone, such as are at Kensington, but longer and easier, with iron rails of good work; the floor and hearth-places to be well paved with marble; the walls to be wainscoted 20 ft. high, with fine doorcases; that the Guard-chamber be fitted for arms, as at Windsor and other houses; the Presence-chamber be fitted for hangings, with marbles in the chimney and the stools of the windows, and proper ornaments; the Drawing-room in like manner, though with some variety, as having the best furniture; that the Gallery be fitted for the cartoons with wainscot on the window-side and below the pictures, and between them, and with wainscot behind them to preserve them from the walls, and with a marble chimney and marble "soyies" in the windows, &c. It is also stipulated that the boards of all these rooms ("being already provided very good and dry,") are to be laid after the best manner, without nails, and with battens under the joints. The cost of the work, "thus performed by good artists," is estimated at 6,800*l.* Wren concludes with an opinion that many other things must be done before the Palace is in proper habitable order, the Courts must be paved, more sewers made, and water brought to more places. It may be interesting to add, that in a volume of "Civil List Expenses," preserved in the British Museum, is an entry, under date 1716, of a payment of 487*l.* 10*s.*, to "James Thornhill for Painting the Ceiling of a Room in His Majesty's Palace at Hampton Court."

Hornsey School Board.—We were correct in supposing that the statement in some of the newspapers that the commission to be paid to the architect was "one per cent," was an error. The chairman of the Works Committee, Mr. H. R. Williams, writes to say that the commission fixed by the Board is the usual 5 per cent.

WORKMEN'S COTTAGES IN THE NORTH.

THE proposed improvements in the city of Durham having ended in "smoke," the working men themselves have come to the front through the Durham Co-operative Society, who have resolved to utilise a surplus fund in the bank by purchasing freehold land in the city and erecting thereon a number of model working-men's cottages, of which there is a great want; each cottage to contain four rooms substantially built, and that decency and rarity in the north, a water-closet to each, as well as water.

Owing, however, to the tenure under which a large portion of the land around Durham suitable for building purposes is held, most of the land being held by the Ecclesiastical Commissioners, some difficulty has been found, but the Commissioners appear desirous to give their aid to so laudable an object; and, to prevent any misunderstanding, they will enfranchise the land, and thus secure it untrammelled to the purchasers.

A similar movement has taken place successfully at Leeds.

OUR DRAINS.

(FOR USE OF SCHOOL BOARD SCHOOLS.)

OUR drains! our drains! our foul, leaking drains!
They poison the air of our streets and our lanes,
In city and suburb, in hamlet and town,
'Neath dwellings and workshops wherever laid down.
Can reason still fail young and old to convince
That sewer-gas slaughters both peasant and prince?
How can we have health if the blood in our veins
Is poison'd by breathing foul air from the drains?

Our drains! our drains! our badly-made drains!
That give out their smells ere and after it rains,
Sickening the robust man walking the flags,
Prostrating the half-nourish'd worker in rags;
Swift-stealing through panels where fashion and rank
Sit proudly on cushions, in drives from the Bank.
But headache and faintness, and death-boding pains,
Go home in the carriage to tell of the drains.

Our drains! our drains! our death-dealing drains!
Choked up, with no outlet for rotten remains;
Chronic hotbeds of typhoid, full of foul silt,
Reflecting our ignorance, proving our guilt,
And showing that we have been riding rough-shod
O'er Nature, and morals, and maxims of God.
For pure air and water, in cities and plains,
Spell health, if we keep right our dwellings and drains.

THE VENTILATION OF DRAINS AND SEWERS.

AT the last meeting of the Royal Scottish Society of Arts, Edinburgh, Dr. Stevenson Macadam read a paper "On the Ventilation of Drains and Sewers and the Cleansing of House Cisterns." The water-carriage system of disposing of sewage was, he said, a pernicious system. It poisoned our streams and the air above them, and promoted disease in our households. While, however, he was no friend to that system, he was not prepared to go back to old methods nor adopt any of the new systems proposed in its place. He wished to direct attention to a mode by which the evils attending the present system could be to some extent lessened or modified. As a preventive of the evils resulting from the return of gases from the main sewer, he suggested that besides the syphon trap at the water-closet, there should be a U-shaped trap between the main sewer and the house, from which trap a fireclay pipe should lead to the air, with a charcoal absorbent cage at the top. Town drains should be ventilated, and the air passed if possible through furnaces in constant operation, or through shafts filled with charcoal. He dwelt on the necessity of periodically cleansing cisterns with a soft brush. Mr. E. Sang (secretary) then opened the discussion on the general subject of sanitary arrangements. He pointed out that the present system of carrying away sewage had infiltrated the whole subsoil of the city with offensive matter, while it wasted good wholesome water at great expense. Good manure was also being by the water system carried away in the most reckless manner to the sea. He was therefore in favour of Captain Liernur's system, which could collect and utilise the sewage without mixing it with water. Mr. William Marshall approved of the Liernur system if it could be shown to work safely. Dr. Alexander Wood said that the present system of drainage ran counter at every point to nature, and the palliatives offered by Dr. Macadam and others were pitiable when the evils of the system were regarded. He pointed to the advantages of the immediate removal of effete matter in a solid state.

COLOUR IN THEORY.

SIR,—There is a passage in my recent letter which is so involved that I must beg to be permitted to set it right. It should have run as follows:—

"The believer in the undulatory theory cannot, indeed, consistently assume colour to be the inherent property of the vibrations themselves, for then the selfsame elastic medium would possess the wonderful property of being of all colours at one and the same time. Vibrations, it is true, produce in us the very different sensations of heat, light, colour, and sound, and in our too frequently unreflecting way we accredit the vibrations themselves with the properties of the sentient, with the sensations which they excite in us. A sensation of colour is the result of mechanical action on the optic nervous system, of the contact of either a vibration or an impulse, with the sentient. But why a simple mechanical action should produce, in one case, the sensation of heat, in another case the sensation of sound, and in a third case that of light, will probably never be solved."

Our senses deceive us in many things, and in none perhaps more completely than the subject of light. We cannot, offhand, be confident that our first notions upon any portion of that subject are right. Mr. Colling is positive that Nature produces *green* by a compound process; that the sensation of green is always,—speaking by the card,—the united, the compounded, activity of the yellow and blue waves. I will not give my own views of the matter at present, if I can help it, but the science of it as the science now stands. It is this, that the mechanical admixture of two sufficiently finely-powdered pigments,—reflecting, the one, let us say, the blue producing wave, the other the yellow,—will produce in us the sensation of green. Two different waves of the prismatic spectrum may also be combined to produce a colour sensation differing from that produced by either separately. But it is said that the waves of these mechanical compounds may again be resolved, separated, into their original elements, but that the prismatic wave producing the sensation of green, or of any other colour, cannot be decomposed. I say this is what we have been taught, and if this teaching be correct, we are enabled to make a very useful generalisation, viz., that certain sensations of colour can be produced either by a combination of waves, or by a single undecomposable wave.

W. C. T.

"THE PALATINATE."

SIR,—Will you kindly allow us to add a few remarks to your recent lucid account of these buildings?

The extent of ground we are covering is rather more than four acres, embracing, when completed, five streets in addition to the frontage in the New Kent-road,—viz., Gurney-street, Pollock-road, Rodney-road, Chatteris-road, and Trafalgar-place, all included in the term "Palatinate," and offering accommodation for nearly 600 families.

In erecting these buildings to meet the requirements of the middle classes residing in the metropolis, we have aimed to form an entirely new locality, embracing dwellings as distinct as ordinary houses, with more ample appliances and conveniences than have hitherto been obtained, at the same time obviating many sanitary and other defects so usually complained of in the dwellings available for the classes in question.

The height of the buildings facing the New Kent-road, near the Elephant and Castle, is 60 ft.; that in the other streets, 50 ft.

We are not, nor ever have been, contractors; but are carrying out this experiment as an investment pure and simple.

SUTTON & DUDLEY.

The Cabmen's Shelter Movement.—The success resulting from the establishment of the Calverley-street Cabmen's Shelter, Leeds, has been such as to encourage the promoters of the movement to place two more shelters, viz., at the New and Central Railway Stations, which are expected to be ready for use during this month. Both shelters are comfortable, with sufficiently commodious rooms, each being 15 ft. long and 9 ft. wide. They are constructed of wood, the upper part of the sides glazed. The builder is Mr. John H. Thorp, of Leeds, and the cost will be 75*l.* each. Amongst the subscribers to the shelters were upwards of eighty cabmen. In the neighbourhood of Leeds, Huddersfield has opened a shelter, and Halifax is starting a movement for providing them under the auspices of the Mayor (Mr. Edward Crossley). In other places also shelters are being erected, and everywhere they are successful, meeting a real want.

THE LATE MR. JAMES GODWIN.

FELLOW-STUDENTS and friends will hear with much regret of the death of this gentleman, which took place, at a comparatively early age, very suddenly, at his residence in West Brompton, on the 18th inst. Mr. James Godwin studied as a painter, was a student of the Royal Academy, and early gave promise of great excellence in his art. He illustrated very successfully a number of books for Messrs. Blackie and other publishers, and, for several years, the Christmas number of the *Illustrated London News* contained evidence of his versatile fancy and skilful draughtsmanship. One of his pictures, "Hamlet and Ophelia," exhibited, on the line, at the Royal Academy a few years ago, obtained remarkable encomiums from men able to judge. He also wrote with ability, and in fact a bright career seemed in store for him; but it was stopped by what proved an overwhelming calamity,—the simultaneous death of a much-loved wife, a child, and his wife's mother, to whom he was equally attached. His mind never recovered from the shock, and although he occasionally drew or painted, his energy never returned, he was unable to satisfy himself, and the work was destroyed as soon as done. But for the affliction to which we have alluded, James Godwin might have been a great artist.

THE STRIKE AT ERITH.

AT the special general meeting of the Iron Trades Employers' Association, held at Derby, the following resolutions were carried unanimously:—

"That since, as a rule, employers are compelled by the law of freedom of contract to work by the piece at prices fixed beforehand, the Employers' Association see no reason why workmen should seek to be exempted from the same law, one which the men usually avail themselves of when they are purchasers.

That this Association, recognising this law, will resist any attempt on the part of the men or of their societies to curtail or restrict the application of piece-work in the workshops of the members of the Association."

The report and recommendation of the committee of management as to the Erith strike having been brought up and fully discussed, it was resolved unanimously,—

"That this meeting, having regard to the many innocent persons who would suffer by the general lock-out recommended by the committee of management, hereby authorise the committee, before putting such an extreme me sure into force, to employ the officers and funds of the Association in filling the shops of Messrs. Eastons & Anderson, and to suspend the order for a lock-out at their discretion."

The poll of the 44,174 members of the Amalgamated Society of Engineers to take the votes for and against a levy of 6d. per member in aid of the men on strike is being prosecuted. To carry this out, specially convened meetings of the 384 branch societies in different parts of the country are being held, and the result returned to the general office in London. A return has also to be made of the number of members working short time,—that is to say, three or less days a week. According to this month's return of the state of the engineering and machine-making trades throughout Great Britain, Ireland, &c. (as stated in the *Times*), it appears that, in the various places where branch societies exist the state of the trade is described as very bad in twenty-two towns, bad in 129 towns, working short time in thirteen, reducing wages in three; declining, seven; unsettled, one; discharging hands, four; moderate, 147; good, four; improving, one; no reports, fifty-nine. Disputes are reported to be pending at Battersea, Bury, Hyde, Ashton, Stalybridge, Duckinfield, Dundee, and the London and North-Western Railway's running sheds, Edge Hill, Liverpool.

Messrs. Easton & Anderson have given to the men lately in their employ and now on strike, the following—

"NOTICE.

Those of the men now out who are willing to work by the piece when called upon, and to sign a declaration to that effect, will be re-admitted on application at the office on and before Saturday next, January 22.

The firm desire that it should be clearly understood that after that date none of the men now out can be re-admitted on any terms whatever. Arrangements for the engagement of workmen will be deferred till after Saturday next, except in the case of workmen who may make personal and voluntary application for employment.

EASTONS & ANDERSON.

Head Offices, 65, Southwark-street, S.E., Jan. 17."

Mr. Easton writes:—"By this you will see the strike will be terminated in one way or the other at the end of the present week. Such of the men as like to readopt our mode of carrying on business will no doubt return to their work, and those who do not must seek employment elsewhere. In either case there will be no pretence for them to continue to state that they are our workmen on strike. We have such overwhelming evidence before us that we can obtain the requisite number of men willing to work upon our terms that the danger of a lock-out will also be at an end."

LIGHT AND AIR CASE AT MANCHESTER.

LEA *v.* GRUNDY.

ON the 11th inst. Vice-Chancellor Little gave judgment in this case, in which an application was made by the plaintiff for an injunction to restrain the defendant, who is a building owner, from erecting new buildings on the site of old premises at a greater height than the former buildings. The plaintiff's case was that the defendant's new premises obstructed the access of light to his buildings. His Honour had granted an injunction on the 27th of December last restraining the defendant from further heightening the buildings until the October following, with leave to the plaintiffs to move in the terms of his bill upon giving notice to the defendant. Arrangements were made between the parties by which the defendant's undertaking as to damages was to continue in operation until the hearing of the cause. The property of the defendant had a frontage which reached backwards from Kennedy-street to Booth-street, Manchester. The defendant's old buildings had existed for some sixty years previously to the time when he commenced his present alterations. Originally they had been private residences, but long since had been converted into warehouses or offices for the accommodation of merchants and others. The question at issue was whether the defendant was entitled, in a street 27 ft. wide, to raise his buildings from 45 ft. to 60 ft. above the level of the street. The maximum sky area visible from the plaintiff's present windows did not exceed 36°, and the new buildings would very greatly obscure that amount of sky area. The plaintiff contended that this was naturally a great injury to his property on the opposite side of the street, and, further, that the Court was bound to draw that inference, whatever might be the opinions and views expressed on the subject by the evidence of witnesses who had been examined in the case. The judge decided that there must be an injunction in the terms of the bill. The decree must carry with it the right to the general costs of the suit.

IMPORTANT TO ARCHITECTS AND LOCAL BOARDS.

IN the Queen's Bench division of the High Court of Justice, on the 12th inst., Mr. Wills, Q.C., on behalf of Mr. Phillips, moved for a rule for a *mandamus* calling upon the Local Board of Litchurch, a suburb of Derby, to show cause why they should not approve certain plans for the construction of some china-works which had been submitted to them for approval. Mr. Phillips was the owner of large china-works at Worcester, and he and other persons had bought lands, and were under heavy contracts to the extent of 50,000*l*. With the view of putting up these works, the applicants had plans prepared which were in strict accordance with all the bye-laws of the Local Board, and these were duly submitted to the Local Board; and no objection had been taken that they did not comply with the bye-laws in all matters of construction. The Public Health Act of last year required the sanction of the Local Board, and if this was not given, then the Local Board had power to pull down the buildings if they were proceeded with. The Local Board passed a resolution to the effect that they could not allow Mr. Phillips to erect china-works, because its working would establish "a noxious trade or manufacture, according to the 112th section of the Act." The Local Board had entirely misconstrued the 112th section. It did not give them power to say that the works when completed would prove a nuisance to the neighbourhood. They were simply to decide whether the plans complied with the bye-laws; and if afterwards they were proved to be a nuisance in working, the owners would be liable to a penalty of 50*l*. per day. Mr. Phillips had carried on similar works in Worcester without causing any nuisance. It could never have been intended that the Local Board were to be judges as to whether a business would be a noxious trade.

The Lord Chief Justice.—Take a rule.

THE ASSOCIATED CARPENTERS AND JOINERS OF SCOTLAND.

THE fourteenth annual report of this Association has been submitted by the general secretary (Mr. Wm. Paterson). The members are congratulated on the continued prosperity and usefulness of the Association, the membership and branches showing a considerable increase, and the reserve fund steadily accumulating. Referring to the reduction of wages in the Clyde district which had been accepted after a strike of a few weeks, the report points out that although wages were advanced to the old rate a few months after, yet the men working in the shipyards had no corresponding advance to that obtained by those in the house shops. "There is," says the report, "no apparent reason why this state of matters should continue, if the shipjoiners can be roused to a proper sense of the cause that has kept and still keeps them in the rear. The remedy is in the hands of the shipjoiners, and the fault is their own if the grievance is continued. In all the other disputes success attended our efforts, so that, generally speaking, wages are on an average about 2s. more per week at the close than they were at the beginning of the year. A considerable number of the branches have also obtained the 51-hours week. The day is not far distant when the 57-hours week will entirely disappear from our report and the trade. Parliament last session removed almost entirely the restrictions that operated so much against us as workmen and trade-unionists. It is not for us to inquire whether this action was stimulated by a sense of justice or by a desire to please. In the labour laws of last session we have got what we were often told we would never get, and although exception might be taken to some clauses, the measures are good and give a freedom we did not expect for many years." The receipts for the year amount to 8,165*l*. 5*s*. 3½*d*., being 1,349*l*. 13*s*. 10½*d*. of an increase as compared with last year. There has been paid as sick aliment 2,612*l*.; as funeral allowance, 545*l*.; as tools' compensation, 409*l*.; as strike allowance, 614*l*.; as victimised allowance, 7*l*.; as bonuses to two disabled members, 100*l*. There is a balance placed to the credit of the Association of 1,367*l*. 13*s*. 11½*d*., which brings the funds in hand to the sum of 10,439*l*. 2*s*. 7½*d*.; of this sum 8,162*l*. 16*s*. 5½*d*. is the property of the trade section; and 2,276*l*. 6*s*. 2*d*. belongs to the sick section. There are 861 more members than last year.

WALLS OF ROME.

AT the *conversazione* of the British and American Archæological Society of Rome, held on Monday, January 3rd, Mr. Parker exhibited a drawing, by Signor Cicconetti, of the arch or doorway at the south-west corner of the Quirinal-hill, in a cellar under the villa of Cardinal Antonelli, in a line with the Via Nazionale, which is being partly rebuilt from below. This arch has been called the Porta Fontinalis, and is probably near to the site of that gate in the wall of the kings, but Mr. Parker showed that it cannot be a gate in the wall of Servius Tullius or of any of the earlier kings, for these reasons:—the walls of the fortifications of the time of the kings were 12 ft. thick., the wall of this arch is only 3 ft. thick. It has been rebuilt of old materials; the jambs are not of the same stone as the arch; it is built upon a wall of concrete and not upon the solid tufa rock, as all the walls of the kings are. The builders have been afraid to trust the soft tufa to carry the weight of the wall of the house above, and for that reason there is a brick arch of the time of Constantine over the arch of tufa to support the weight. Part of the original wall of the fortification of the Quirinal-hill remains near to it, but not on the same line, and on a much higher level; on the other side of that wall is part of the pavement of the street made in the inner fosse with a drain on the other side of it. There were originally two arches about 10 ft. apart, one of which was destroyed by the workmen, but the large blocks of stone of which it was built were lying about when this drawing was made; the old wall on the cliff above forms an angle near this point, and in the wall which is at an angle with these two arches is the jamb of another doorway of the time of the kings, only one jamb remains, but that appears not to have been moved, possibly the stones taken from it were used for the arches below, and this may be one jamb of the Porta Fontinalis. The two arches may possibly have been entrances into

the thermæ of Constantine, of which there are remains in the Colonna gardens not very distant from this spot, in the same direction, and on the same side of the road. The brick walls of these thermæ are built upon a stone wall of the time of the kings, which is used as a foundation. These solid old walls of the time of the kings have been found very frequently used in the same manner.

REMOVAL OF LEAD FROM WATER.

SIR,—A "Medical Officer of Health," in your issue of December 18th, questions our assertion that the Silicated Carbon Filter has the power of removing lead from drinking-water, and he calls in the aid of our old acquaintance the "merest tyro in science" to bear out his own gratuitous statement, that "a filter can only remove what is mechanically suspended in a liquid." With all due deference to a "Medical Officer of Health" and the "merest tyro," we must refer them to any of the modern analytical chemists, who will inform them that certain forms of carbon are capable of removing the salts of lead from solution in water, and we again unhesitatingly assert that our filters will do so.

We now invite your correspondent to make a solution of lead, containing the largest proportion of the metal that drinking-water is likely to absorb from contact with leaden cisterns or pipes,—say half a grain to a gallon,—and bring it with him to these works, where our chemist will have much pleasure in affording him every facility for performing the experiment himself.

THE SILICATED CARBON FILTER COMPANY.

COMPENSATION CASE.

EXTENSION OF THE LIVERPOOL FREE LIBRARY.

MR. J. J. ASTON, Q.C., assessor, and a jury, sat on the 5th inst. in the Sheriff's Jury Court, St. George's Hall, to assess the compensation to be awarded to the owner of a public-house at the corner of William Brown-street and Mill-lane, required by the Corporation for improvement purposes in connexion wit the Free Library and Art Gallery. The house is at present occupied on a lease of which three years are unexpired. The present rental is 110*l.* a year, and Mr. Peter Ellis was called and valued the property, including 10 per cent. for compulsory sale, at 3,618*l.*

Mr. Wylie's valuation on an increased rental of 200*l.* at the end of the present lease was 3,746*l.*

Alderman Rigby, the present lessee, said that about two years ago he made a *bond fide* offer of 3,100*l.* for the property, but withdrew on learning that the Corporation intended acquiring it.

For the Corporation, Mr. Cawley, C.E., Manchester, was called, and gave it as his opinion that the increased rental which the property would bring at the expiry of Alderman Rigby's lease would only be 120*l.*, and he estimated the compensation at 2,020*l.*, including the customary 10 per cent.

Mr. W. R. Picton said that 110*l.* would be the full rental, and that, allowing 5 per cent. for leakages, he considered 2,299*l.* to be a fair compensation.

The jury fixed the compensation at 2,900*l.*

FAIRBAIRN MEMORIAL.

SIR,—I notice in your impression of January 8, that my price for the above statue "is 750*l.*" I wish to say that the price by one of the contesting sculptors was 750*l.*, but the price I gave, and received the commission at, is 840*l.*

E. EDWD. GEFLOWSKI.

BUILDING PROVISIONS IN AMERICA.

THE New York Board of Health requests the Department of Buildings to require, in accepting specifications for buildings in future,—

1. That the iron soil-pipe and the waste-pipe be extended through the roof for 2 ft., at their maximum calibers, and that the waste-pipe be independent of the soil-pipe.

2. That every basin, sink, and bath-tube be properly trapped.

3. That the pipe connexions be lead, calked or otherwise securely sealed.

4. That the location and direction of the house-drain be accurately indicated by a diagram with measurements, or by measurements from walls or other permanent landmarks, so that it may be readily reached when necessary.

5. That the department forbid the use of brick drains or wooden as substitutes for pipe-drains, and that separate sewer connexions be required when practicable; and

6. That the house-drain be trapped under the area or near the cellar-wall, in addition to all other traps whatsoever.

Society for the Encouragement of the Fine Arts.—The first of the four *conversazioni* given during the season by this Society took place on the 13th inst., at the gallery of British Artists, Suffolk-street, Pall-mall, and was numerously attended, the company numbering about 500. It was a music night, and the programme was carried out under the direction of Mr. Alfred Gilbert.

CHURCH-BUILDING NEWS.

Gloucester.—St. Michael's Church, Gloucester, was re-opened on the 21st ult. The church, with the exception of the tower, was rebuilt twenty-five years ago, from designs by Mr. F. S. Waller and the late Mr. T. Fulljames, and was consecrated in 1851. But some of the carving, and other parts of the design, were left unfinished from want of funds. Soon after the appointment of the Rev. G. James as rector, it was determined to alter and greatly improve the building; plans were furnished by Messrs. Waller, the contract was taken by Mr. A. Estcourt, and the work is now completed. The old vestry and organ-loft have been removed, and a new vestry erected on a part of the site of the ancient burial-ground. The space thus obtained has been made available for the fitting up of the organ on the floor, and also for some additional seats at the east end of the aisle. The old seats in the nave as far as the second pier from the east have been removed, and in this space have been placed new choir-stalls, the whole of the floor having been raised 6 in., and the chancel thus enlarged has been separated from the nave and aisle by means of low stone screens, that between the piers of the arcade being surmounted by ornamental iron-work. The unfinished carving has been completed by Mr. Henry Frith. The groining of the tower has yet to be done. The present work will cost between 600*l.* and 700*l.*

Midsomer Norton.—Application has been made by the vicar and churchwardens at the Diocesan Court, Wells, and a faculty has been granted, to permit the execution of extensive alterations in the fabric of Midsomer Norton parish church. Through the liberality of one of the parishioners, Mrs. Savage, a handsome stone and marble pulpit will be substituted for the present "two-decker." It is proposed to build an extension of the chancel, and to remove the organ from the west gallery into a chamber formed out of the south-east vestibule. The galleries will be approached by a new entrance under the tower; and the high pews will be replaced by more commodious open seats. Plans have been prepared by Mr. Gane, architect, of London. The church was rebuilt forty years ago.

Arbroath.—During the ensuing summer some extensive alterations are to be made in the fabric of Abbey Church, Arbroath. A portion of the front wall is to be taken down, and a new one erected at some distance out on the open space in front of the building. This will contain a vestibule and also new stairs leading to the gallery, so that the space at present occupied by the stairs may be utilised for additional pews. The gallery itself is to be cleared out, and a new one erected. These alterations will cost 2,000*l.* Mr. James Maclaren, architect, Dundee, will superintend the work.

Boroughbridge.—Christ Church, adjoining the villages of Marton & Grafton, near Boroughbridge, was consecrated on the 11th inst. The church is built to accommodate 122 persons, and has been erected by Mr. Joshua Naden, builder, of Knaresbro', from plans prepared by Mr. John Ladds, architect, of London. It consists of a nave, 41 ft. long, 21 ft. 6 in. wide, 17 ft. high to the wall plate, and 35 ft. high to the ridge. The chancel is 22 ft. long by 18 ft. wide, 14 ft. 6 in. high to the wall-plate, and 29 ft. high to the ridge. The style is Early Decorated, and the cost has been about 1,700*l.* In removing the old church which formerly occupied the site there were found a number of worked arch stones, also jambs, shafts, caps, bases, and stone crosses, built into the walls in all directions, evidencing that there had been one or two earlier churches on the site. After the stones had been thoroughly fitted, it was found that many of them originally belonged to a fine Norman arch, with richly-moulded arch and jambs, which the vicar has been instrumental in having carefully restored and used as a doorway from the church to the vestry. Mr. W. Lewis, of York, was clerk of the works.

Donhead St. Andrew.—After having undergone restoration and refitting of its interior, the parish church of Donhead St. Andrew, Wilts, was re-opened on the 12th inst. The edifice is in the Perpendicular style, and consists of a nave and side aisles, with a spacious chancel, and an embattled and pinnacled tower at the west end. The aisles are separated from the nave by an arcade of three bays, and the ancient windows of the clearstory and of the aisles of the north and south are square-headed. Previously to the reparation, the interior was in a most dilapidated and uncomfortable state. The unsightly high pews have been removed, and have been replaced by sittings of stained deal. The gangways are laid with Godwin's tiles. Under the floor are hot-water pipes for heating the church, the apparatus having been supplied by Mr. Richardson, of Wincanton. The chancel is paved with enamelled tiles, and the new steps are of Portland stone. The columns of the arcade have been renewed. A gallery at the west end of the church has been removed, and the lower part of the tower has been fitted as a baptistery, a new stone base having been added to the ancient font. A new oak pulpit, of good design, rests on a stone base. The contract for the work was executed by Mr. T. B. Miles, of Shaftesbury, from designs by Mr. Kemp, of London. It is intended to place an organ in the church, and a chamber for it will be formed on the north side of the east end of the church.

SCHOOL-BUILDING NEWS.

Ebchester (*Co. Durham*).—A new school-room has recently been erected in this village, from the designs of Messrs. John Smith & Son, architects, of Shotley Bridge, and was formally opened in December by the Rev. Archdeacon Prest. The school is Gothic in style, and of a strong, substantial character, and provides accommodation for 100 children.

Sherborne.—Newland Infant Schools, Sherborne, were re-opened on the 6th inst., after undergoing alteration and improvement, from plans prepared by Mr. T. Farrell, architect. The unsightly dead wall next the street has been replaced by a wall of faced stone, and pointed, and the windows of the mistress's house have been renovated, and made to correspond with those in the old school-house, which formerly received its light from the back, but is now lighted by four stone pointed twin windows with iron casements inserted therein. The gallery in the old schoolroom has been repaired and enlarged, and the room has been fitted with polished desks and seats. An entirely new schoolroom, 30 ft. by 20 ft., has been added to and approached from the old apartment. This room is also lighted by two twin pointed windows on the west, and one on the east side, and by a triple window on the north side, and is also fitted with desks and seats on iron standards. The whole of the improvements have been effected at a cost of about 450*l.*

Miscellanea.

Fatal Scaffold Accident. — Last week Dr. Hardwicke held an inquest on the body of Jeremiah Lovett, a labourer, killed by the falling of an immense stack of timber and a scaffold, at buildings in course of erection on the premises of Mr. Sage, builder and shop-front fitter, of Gray's-inn-lane. Mr. Driscoll, a labourer, said that he was working with deceased on Tuesday afternoon on a scaffold at new buildings, adjoining their premises in Verulam-lane. Witness was engaged in stacking timber on this scaffold, and deceased was below, serving mortar to a bricklayer. All at once the scaffold gave way, and the whole of the timber, in weight about six tons, was shot off, and the large bulk of it fell upon deceased, who was so deeply buried under the timber that it took a quarter of an hour before he could be got out. The only support to the scaffold on which all this timber was stacked was two uprights and two transverse poles, resting in sockets made in the brickwork of an old wall, which, on account of its rottenness, had collapsed and bulged out with the weight of the timber on the scaffold. The scaffold had been erected under the direction of Mr. Sage's brother, the foreman of the works. Ultimately the jury returned a verdict of "Accidental death, but at the same time the jury further believe that the accident occurred through neglect or the want of proper precautions in the construction of the scaffold on which such a mass of timber had been placed." Mr. Sage, the foreman, was called in, and informed that, although the jury had abstained from returning a verdict of Manslaughter, the firm were liable, upon their verdict, under Lord Campbell's Act, for compensation to the widow and family of deceased for the loss they had sustained by his death.

Rheims Cathedral.—It is stated that M. Wallon has ordered the restoration of Rheims Cathedral, at a cost of 2,000,000 francs.

Fires in London.—From the report of the chief officer of the Metropolitan Fire Brigade (Captain Shaw) on the state of the brigade and the fires in London, during the year 1875, made to the Metropolitan Board of Works, we learn that the number of calls for fires or supposed fires received during the year has been 1,668. Of these 90 were false alarms, 49 proved to be only chimney alarms, and 1,529 were calls for fires, of which 163 resulted in serious damage, and 1,366 in slight damage. These figures refer only to the regular calls for fires, or supposed fires, involving the turning out of firemen, fire-engines, horses, and coachmen; they do not include trifling damages by fires which were not sufficiently important to require the attendance of firemen; neither do they include the ordinary calls for chimneys on fire, which are separately accounted for. The fires of 1875, compared with those of 1874, show a decrease of 44; and compared with the average of the last ten years, there is a decrease of 59. The proportion of serious to slight losses in 1875—163 to 1,366—is about as favourable as the Brigade has hitherto succeeded in making it.

Navy Oak.—The Secretary of the United States' Navy, in his recent report, calls attention to the importance of securing, before it passes entirely away, as great a quantity as possible of the sea-shore live oak of the country, which he describes as the best timber of the world. He says:—"The rapid deterioration of all our vessels built of other wood constantly warns us how invaluable is this timber, now so rapidly passing away. It is the growth of centuries, and when once gone will never be replaced. The supply, which was never large, is being rapidly exhausted, and it becomes yearly more difficult to procure, as what is left is being largely bought up for shipment abroad. All of it that was laid up by old Navy Commissioners was consumed during the war, and the Department has been endeavouring for the past few years, whenever it had the opportunity and the means, to secure what could be had for the present use, or to be laid up to season for the future use of the navy. In the opinion of the Department, measures should be taken, if possible, to prevent the exportation of such of this timber as is left on our southern coast, and to secure it for the use of the Government."

The New Law on Land Transfer.—On the 1st inst. the statute to simplify the title and to facilitate the transfer of land in England took effect. This Act will supersede the Land Registry Act of 1862, and the registrar and other officers will be attached to the new law. It points out certain persons who "may" register property under the same. For instance, any person who has contracted to buy for his own benefit an estate in fee simple in land, any person entitled for his own benefit, at law or in equity, to an estate in fee simple, and any person capable of disposing for his own benefit, by way of sale, of an estate in fee simple in land, whether in either case subject or not to incumbrance, "may" apply to the registrar to be registered under the new Act, with a proviso that in the case of land contracted to be bought the vendor consents to the application. The statute contains 129 sections, divided into five parts, and repeals a part of the Vendor and Purchaser Act, 1874. No application can now be entertained for registration under the Land Registry Act of 1862, which was brought forward by Lord Westbury, and it remains to be seen whether the present measure, introduced by the Lord Chancellor, will be generally adopted.

Decoration of Gainsborough Parish Church.—Workmen are now employed in decorating the interior of the parish church, Gainsborough. A short time ago a copy of Leonardo da Vinci's picture of "The Last Supper" was given by an anonymous parishioner, and placed in the centre compartment of the reredos, immediately above the Communion Table. Soon after this gift was presented, it was decided to make an effort to decorate the whole of the apse in a permanent and worthy manner. After mature consideration the plans of Mr. Knowles, of York, were accepted, and the work is entrusted to him. The cost of these adornments is estimated at 125*l.*

Chester Cathedral.—The *Chester Chronicle* states that it is the intention of the Dean and Chapter to place a spire upon the tower of the cathedral, in accordance with the model which has been exhibited for some time past in the Chapter-house.

New County Buildings, Dumfries.—An important addition to the architecture of English-street, Dumfries, has recently been completed. Formerly the head-quarters of the Dumfriesshire Constabulary and the department of Weights and Measures were accommodated in small, dingy, and ill-arranged premises in the street just named, which the Police Committee of the county three years ago resolved to replace with a building suitable and commodious for the purpose required, and externally in keeping with their character. Accordingly they employed Mr. Barbour, now of the firm of Barbour & Halliday, architects, to prepare plans, and these having been submitted to and approved by the Government, were proceeded with and carried out, at an estimated cost of 3,300*l.* The building is three stories in height, and is Scottish Baronial in style. There is a central portal arch, flanked on one side by a massive loop-hooled tower, 65 ft. high, and on the other by a square "keep," which attains the highest elevation of the building. The contractors were:—Mason work, Crackstone & Son; joiner work, Mr. Mein; slater work, Mr. Bridges; plumber work, Mr. Ramsay; plaster work, Mr. Dickson; glazing and painting, Mr. Costin.

Reredos at Stoke Church, Ipswich.—The stone panels of the reredos in Stoke Church, Ipswich, have been filled with full-length figures in oil painting on a gold background, in the style of the early Italian school. This painting is the work and gift of Miss Lacon, and has been executed at the Ipswich School of Art, under the superintendence of Mr. T. W. Griffiths. The eight panels, 9 ft. in length, contain the figures of the four major prophets, and the four Evangelists. Isaiah, Daniel, St. Matthew, and St. Mark occupy the north side; St. Luke, St. John, Jeremiah, and Ezekiel the south side. Each of the prophets bears a scroll on which is written his chief Messianic prophecy. The space beneath the figures is occupied by floral decorations. Each of the Evangelists bears a golden book of his Gospel. Beneath appear their distinctive symbols. The central portion contains four angels, in the early Florentine style, with wings worked on gold, and mantles alternately red and blue. They hold inscribed scrolls. The central cross of white marble now stands out from a gold back-ground having a broad border of red, gold, and black, and the Eucharistic emblems.

Noxious Gases.—At the last quarterly meeting of the North-Western Association of Medical Officers of Health, held in Manchester, a report on the effects of chemical gases on human life and health was read. The medical officers of districts in which chemical or allied works are carried on had replied to a series of questions submitted by the Association. Their suggestions for the amendment of the evils resulting from the chemical-works nuisance were summed up thus:—"First, the removal of the works from the vicinity of inhabited houses; second, the reduction of the legal maximum of noxious vapours allowed to be discharged; third, emitting the vapours for the most part when the wind will carry them in a safe direction; fourth, the more stringent application by sanitary authorities of the legislative provisions already existing; fifth, the adoption by manufacturers of the most approved scientific processes; and sixth, requiring the removal of all sulphur from alkali waste before deposit."

Rhyl Winter Gardens and Aquarium.—The ceremony of cutting the first sod of the Rhyl Winter Gardens and Aquarium took place on the 4th inst. The proposed establishment will be situate on the west side of the town, in close proximity to the sea, some thirty-six acres of land having been purchased on which to erect summer and winter gardens, the latter of which will be enclosed, and will be on a somewhat similar plan to those at Southport. A marine and fresh water aquarium will be formed, and a large lecture and concert hall is to be erected capable of seating 2,000 persons, together with a dining-hall for 1,000 diners. A large proportion of the land will be laid out as a park, natural and artificial terraces being erected to add to its appearance; another portion will be leased for building villas upon.

The Aberdeen Painters.—The Aberdeen house and ship painters, at a large meeting held on the 12th inst., in Glennie's Hall, Queen-street, unanimously resolved to ask for a rise of 1½d. per hour, to take effect on the 1st of March.

A Powerful Organ.—Says the London correspondent of the *Liverpool Journal*:—"Private organs become more popular in London every year, and threaten soon to compete with the piano. But I suppose that no such private organ has yet been erected as that which was opened at Primrose-hill on Saturday. It belongs to Mr. N. G. Holmes, the well-known engineer. The designs were by Mr. Best, of Liverpool; the builders were Messrs. Bryceson. It is an immense instrument to be placed in a private house. It has four key-boards, sixty-five speaking stops, and 4,209 pipes. In connexion with the great organ is an "echo organ," built away from it, and worked by the electric action. Then there is a carillon, or peal of bells. Altogether, Mr. Holmes has power enough in his house to please his neighbours for a quarter of mile round, or, if he pleases, to make life unbearable to them."

Defences of the Metropolis.—The newly-built powerful forts on the banks of the Thames between London and Sheerness have had their armaments completed. These consist, in some cases of 38-ton, and in others of 9-inch or 12-ton guns, which in all cases are mounted upon the patent carriages, by the machinery of which the gun can be elevated or depressed, or its position changed with the utmost facility. As bearing indirectly upon the defence of the metropolis, it is stated that the first of the forts that are to be erected on the heights above the Medway at Borstal, Rochester, intended to form a chain of land defence for Chatham, will be shortly commenced. At this work, which will be one of great magnitude, the convicts now occupying the new convict establishment at Borstal will be employed.

"Harrison of Chester."—At the meeting of the Chester town council, on the 12th inst., the town clerk read the following letter, dated dated January 11th, 1876, and signed "Ann Boseley."—"9, Whitefriars. Sir,—My relative, the late Miss Ann Harrison, who died the 6th of October last, having bequeathed to me a portrait of her father, Thomas Harrison, the eminent architect, formerly of this city, and also two medals presented to him by Pope Clement, I beg to ask your acceptance of the same on behalf of the corporation. I inclose a copy of an article from the *Gentleman's Magazine*, May, 1829, containing a short biography of Mr. Harrison, and an account of the medals." The portrait and medals were accepted.

New Vicarage, Clee St. Margaret.—The new vicarage-house for the parish of Clee St. Margaret, Worcestershire, has just been completed, and was inspected a few days ago by the architect to the Ecclesiastical Commissioners. It has been built of local stone, with Grinshill stone dressings, and lining of local brick, by Mr. Thomas Pugh, of Hungerford, near Much Wenlock, from the designs of Mr. W. M. Fawcett, architect, Cambridge. The total cost has been about 1,700*l.*, a considerable portion of which was contributed by the Ecclesiastical Commissioners. The porch and entrance-hall floors are laid with tesselated tiles manufactured by Thoms, of Broseley, under the superintendence of Mr. Bathurst.

Important Federation of Trade Societies. At the Trades Congress held in Liverpool about a year ago, a scheme was submitted for the federation of organised trade societies, with a view to raise an immense fund to enable them to meet the great associations of capital on equal terms, especially in cases of dispute. The matter was again considered at Glasgow in October, when the scheme was approved of, and the rules for the guidance of members have just been issued. They set forth that, in the interests of labour, it is imperatively necessary that united action should be taken by the powerful trade organisations of the country for mutual protection under exceptional circumstances.

Enlargement of the Salop and Montgomeryshire Lunatic Asylum.—The visitors of the Shropshire and Montgomery Lunatic Asylum at Bicton, near Shrewsbury, have just reported to the magistrates that, in their opinion, it will be necessary to enlarge the asylum by building new wings on the male and female side. Four acres of land have already been purchased on the west of the present building. The amount of the additional accommodation to be provided is for no fewer than 200 patients, being an increase of about one-third of the present number. Plans are about to be ordered from the County Surveyor.

Coroners' Courts.—The principle of establishing Coroners' courts in the various metropolitan parishes, which originated in St. Pancras, in the central district of Middlesex, has been further carried out by the establishment of a court at 15, South Wharf-road, Paddington, adjacent to St. Mary's Hospital. The room contains an elevated platform for the coroner, with suitable accommodation for the press, and plenty of seats for the jury, witnesses, and the public. These courts will supersede the use of public-houses for the holding of inquests, and not one hour too soon.

Iron Waste.—Efforts have recently been made in America, it is said with success, to introduce the process long since turned to good account at Sechshaus, near Vienna. Iron and tin-plate scraps are reconverted into valuable merchantable products. From all tin-plate and soldered articles the tin is first separated, and the iron is subsequently melted into a very high quality of metal. In the course of the process various by-products are obtained, which are said to pay all working expenses, so that the value of the tin and iron is all clear profit.

Chester Archæological Society.—The second meeting for the present session was held in the Society's apartments, Albion Rooms, Lower Bridge-street, on the 17th inst., when Mr. John Brown read a paper on "The Ancient City of Ephesus, including a short description of the celebrated Temple of Diana,—being notes and recollections of a recent personal visit to that historic site." The lecture was illustrated by a series of large photographs and drawings of the ruined city and temple of Ephesus, as well as of the chief palaces and mosques of Constantinople, Smyrna, &c.

Tramway Cars for Working Men at Edinburgh.—At a meeting of the Lord Provost's Committee on the 12th inst., it was resolved by a majority of ten to six to recommend that the Town Council, as local authority, request the Edinburgh Tramway Company, in terms of their Act of 1871, to run cars upon all their routes before seven o'clock in the morning, for the convenience of working men. The hour at which it is proposed the cars should leave the different termini is half-past six a.m. The fare is not to exceed one halfpenny per mile.

The Black Memorial, Edinburgh.—Since the commission for this monument was entrusted to Mr. John Hutchison, R.S.A., the artist would seem to have lost no time in proceeding with the work. His design has been completed in the form of a small model, and he is now engaged upon the full-sized figure, from which the bronze casting will be made. Mr. Black is represented in standing posture, in the fur-trimmed robe of the Lord Provost of the city. With the full-sized model, which is 12 ft. high, considerable progress has been made.

The Edinburgh Plasterers.—It is stated that most of the master plasterers of Edinburgh have received notice, through the secretary of the Operative Plasterers' Trade Union, to the effect that each must dispense with a certain number of apprentices. The general result, it is said, will be a reduction of about twenty in the number of lads learning the trade. If this system were pursued throughout all the trades and professions, what would become of the "residuum"?

The Threatened Wholesale Demolition of City Churches.—The Archdeacon of London has addressed a letter to the President of Sion College, in which he says:—"I do not like to leave you and my rev. brethren of Sion College in ignorance of my sentiments on a matter so vitally affecting the Archdeaconry as the movement about the City churches. I am very sorry I cannot approve of the scheme which seems to be recommending itself to the majority. I look upon it as too closely bordering upon confiscation."

Extensive Improvements proposed for Birmingham.—An inquiry by Mr. J. T. Harrison, C.E., Local Government Board Inspector, was held on the 13th inst., at the Council-chamber, Moor-street, respecting the borrowing of a million of money by the Corporation for the purposes of street improvements and sewerage in this town.

The Liverpool Borough Engineer.—The salary of Mr. Deacon, borough engineer of Liverpool, has been increased from 1,000*l.* to 1,200*l.* per annum.

"Flitting" at the Zoological Gardens.—The lions at the Zoological Gardens, Regent's Park, have this week been removed to their new quarters in the building lately erected from the plans of Mr. Anthony Salvin, and which we described some months ago, in an article entitled "The Lions at Home." At the back of the new lions' house there is now being constructed an open cage, 50 ft. long by 40 ft. wide, in which it is intended the lions and tigers shall, from time to time, take the air.

The Glasgow Painters.—At a meeting of the Glasgow United Trades Council, on the 12th inst., the painters' representative stated that the trade with which he was connected was moving for an advance of wages to the extent of ½d. per hour, and fifty-one hours per week. The employers, however, were opposed to such an alteration, and in several shops had asked the men to engage to work for twelve months on the present arrangements, intimating that those who did not do so would immediately be discharged.

Foreign Cattle Sanatorium, Newcastle.—At the meeting of the Newcastle Town Council, on the 12th inst., it was resolved that an additional story be erected to the Foreign Cattle Sanatorium at the Ouseburn, at a cost of 2,365*l.*, and that the tender of Mr. John Dickson, contractor for the works at present in hand, be accepted. The total estimate for the sanatorium was 15,000*l.* The first contract was 6,094*l.*, to which had to be added the present contract of 2,365*l.*, making a total of 8,459*l.*, exclusive, of course, of the land.

Belsize Park Skating Rink.—On the 12th inst., a new skating-rink was opened for this quarter of London. The rink is the property of Messrs. S. G. & W. Bird, and is situated in the Lancaster-road, three minutes' walk from the Swiss Cottage Railway Station. It is 200 ft. by 100 ft., and about one-third of it is covered in by a substantial roof. The surface is laid with Clarke's patent asphalte. On entering, on the right-hand side, are an office, skate-room, &c.; on the left, a refreshment-room.

Incombustible Wood.—A recent invention by Mr. A. F. Richard, of Dax, France, relates to the preservation and incombustibility of wood by the aid of crystallised chloride of sodium in solution in water at between 6° and 24° by Beaumé's aërometer, and of a solution of chloride of sodium and alum at between 4° and 27°, either mixed in variable proportions or employed separately.

Fire at Bosbury Church, near Ledbury.—On the afternoon of Sunday, the 9th inst., a fire broke out in the roof of Bosbury Church, near Ledbury. The fire occurred at a point where a stove-pipe passed through the roof, and it is supposed that a spark must have fallen upon the timbers beneath the roof. A plentiful supply of water being at hand the damage was not very great.

To Clean Paint and Marble.—It may be useful to some of your readers to know that the "New Californian Ground Borax" is admirably adapted for cleaning paint, marble, and glass; one penny packet (containing about 2 oz.) boiled in two gallons of water would clean the paint of several rooms; a little soap should be used with it.—T. M.

Rateable Value of the City of London.—The valuation lists for the City of London, which come into force on the 6th of April next, show a gross value of 3,577,752*l.*, and a rateable value of 2,982,227*l.* The same values in 1871 were respectively 3,052,086*l.* and 2,556,403*l.*, the new assessments showing an increase of 525,666*l.* gross, and 425,824*l.* rateable value.

New Court-house, Usk, Monmouthshire.—The contract for building the new Court-house at Usk has been let, and the work will be speedily commenced. Messrs. Hill, Higgs, & Co., Crown Works, Lambeth, are the contractors, and the amount of the contract is 9,349*l.*

Death of a Milanese Painter.—On the 7th instant, at Milan, the artist, Signor Cavaliere Luigi Zuccoli, departed this life, after a short illness. This painter gained some of the highest distinctions by his talent, and was honorary member of the Academy of Fine Arts of Milan.

Bricks.—We are informed that the stock bricks used at the Royal Aquarium, Westminster, were supplied by Mr. W. T. Wiseman, of the Hop Exchange, Borough, and Brixton. We also understand that Mr. Wiseman is supplying the Yarmouth Aquarium, and the New National Opera-house, Victoria Embankment.

Tramways for Sheffield.—The Sheffield Corporation have resolved to complete the system of tramways in the town, at a cost of 20,000*l.*

Glasgow Stock Exchange.—The architect is Mr. John Burnet, not Mr. Thomson, as stated.

TENDERS

For rebuilding 21, Leadenhall-street. Mr. E. N. Clifton, architect:—

Simpson	£12,390	0	0
Patrick & Son	12,291	0	0
Lawrance	12,264	0	0
Brass	11,983	0	0
Peto, Brothers	11,630	0	0
Conder	11,240	0	0

For schools, Hanover-street, Islington, for the School Board of London. Mr. E. Robson, architect:—

Roberts, Brothers	£11,165	0	0
Hobson	11,089	0	0
Newman & Mann	11,051	0	0
Williams & Son	10,985	0	0
Downs & Co.	10,653	0	0
Ennor	10,565	0	0
Wall, Brothers	10,501	0	0
Hook & Oldrey	10,470	0	0
Kirk & Randall	10,370	0	0
Lawrance	10,336	0	0
Sheffield	10,259	0	0
Boyce	10,233	0	0
Grover	9,974	0	0

For alterations at 9, Rose-street, Newgate-street. Mr. Wm. C. Banks, architect:—

Eaton	£620	0	0
Larke	620	0	0
Marriage	585	0	0
Sharpe & Everard	540	0	0
Parnacott	525	0	0

For additions to public hall, Walthamstow. Mr. John H. Swan, architect. Quantities by Mr. E. Morfee:—

Lipscombe	£4,406	0	0
Tubby	3,580	0	0
Lawrance	3,284	0	0
Perry & Co. (too late)	3,125	0	0
Sabey & Son	3,120	0	0
Deards	3,084	0	0
Morter	3,075	0	0
Tarrant & Sons	2,960	0	0
Reed (accepted)	2,950	0	0

For the erection of a warehouse, Cowcross-street, Smithfield. Mr. H. S. Benison, architect:—

Rudkin	£2,000	0	0

For building retort-house, coal-stores, &c., at the Plymouth Gasworks. Mr. J. T. Browning, engineer:—

Shaddock	£7,250	0	0
Finch	3,246	0	0
Verren	3,100	0	0
Willcocks, Brothers (accepted)	2,889	0	0

For forming a new road and building coal vaults, &c., Upper Norwood, for Mr. J. Selwin Tait. Messrs. Edward Power & Wheeler, architects:—

Aitchison & Walker	£3,730	0	0
Keeble	3,469	0	0
Anon	3,386	0	0
Carter	3,229	0	0
Brown	3,005	0	0
Crick	2,957	0	0

For alterations and additions to mansion at Silwood Park, near Sunningdale, Berks. Mr. Alfred Waterhouse, architect:—

Smith & Taylor	£27,300	0	0
Parnell	25,800	0	0
Hearn	23,960	0	0
Browne & Robinson	23,500	0	0
Holland & Hannen	22,950	0	0
Perry	22,800	0	0

For the vicarage house, Acton, for the Rev. A. H. Dunn. Mr. E. Monson, architect:—

Baker	£3,947	0	0
Jackson & Shaw	3,582	0	0
Temple & Foster	3,474	0	0
Seale	3,393	0	0
Baker	3,350	0	0
Gibson, Brothers	3,325	0	0
Roots	3,228	0	0
Beale	3,198	0	0
Gregory	3,193	0	0
Hunt	3,190	0	0
Nye	3,124	0	0
Hunt	3,103	0	0
Bartlett	3,100	0	0

TO CORRESPONDENTS.

C. B.—H. W.—A. S.—H. de M.—G.—J. C. K.—E. L.—M. Brothers & Co.—E. H.—C. R.—W. H.—W. W. & Co.—W. C. B.—F. P.—H. B. H.—M.—H. R. W.—E. W.—J. P. S.—A. G. C.—J. P.—F.—P. & W.—S. McB.—G. H. S.—J. B. W. C.—J. B.—T. B. S.—An Old Subscriber (try a circular curtain at the bottom of the cupola. There appears at present to be no certainty as to the result of wires).—J. C. (we cannot undertake the examination requested).—Landowner (we decline to advise in private disputes).—J. J. M. (next week).—J. P. P. (next week).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.